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Number 1.

APRIL, 1903.

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TEXTILE WORLD RECORD

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17 Exchange Place, Providence, R. I.

INCORPORATED FOR THE MANUFACTURE OF

BLEACHING, DYEING, DRYING AND FINISHING MACHINERY

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DYEING
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Drying Machines with Copper and Tinned Steel Cylinders.

Continuous Steaming Machines (Patented).

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(W. P. Simpson, Patentee).

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FLY FRAMES,
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REELS,
SLASHER WARPERS,
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Complete Textile Equipment and Plans for Cotton Mills.

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JOHN HILL, Southern Representative, Prudential Bldg., ATLANTA, GA.

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GILL-BOXES for drawing, fitted with cans or spindles.
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MODIFICATIONS will be made of the above machinery to suit different kinds of work.
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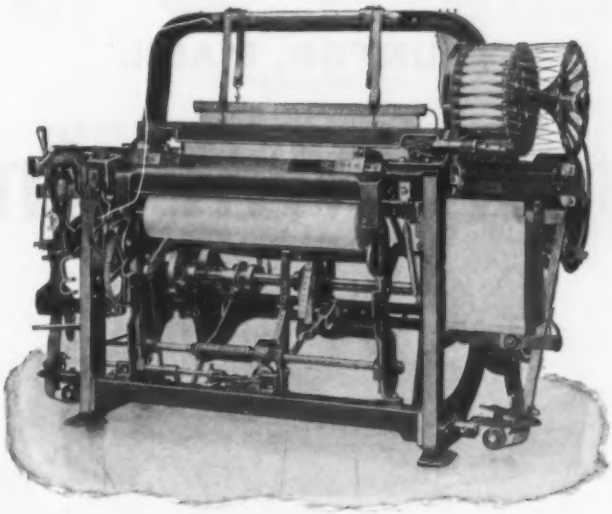

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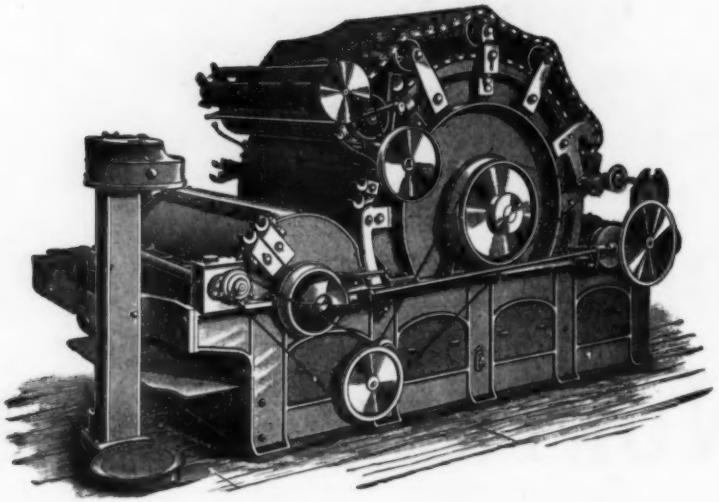

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Solid Forged Steel Cylinders, specially hardened, or with patent inserted walls for fine fabric.

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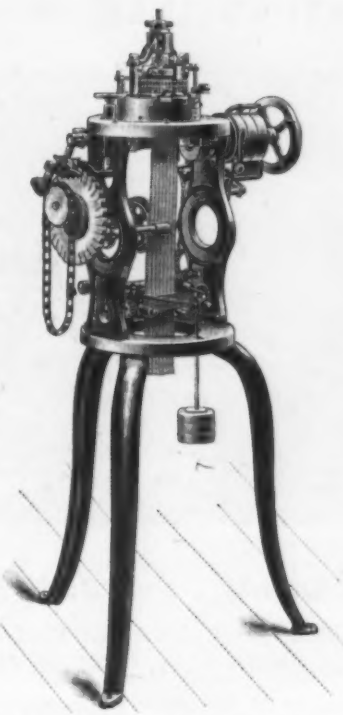

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Sizes 4 1-2 to 2 1-4 inches, inclusive, varying by 1-4 inch.

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Heel and Toe Splicing, Leg Slackening Device, transferring by use of point ring, or two interchangeable cylinders may be used as in the seven-eighths machine

Transferring Device and Double Sole Splicing Device extra.

This Machine is fitted with mechanism for producing Lace Effects.

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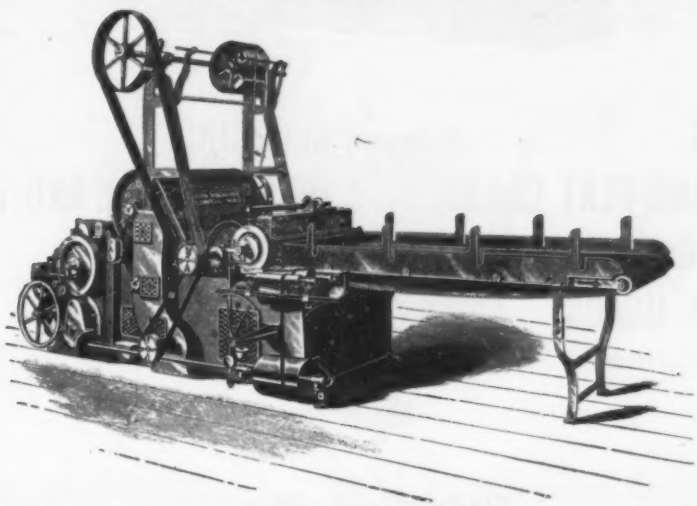

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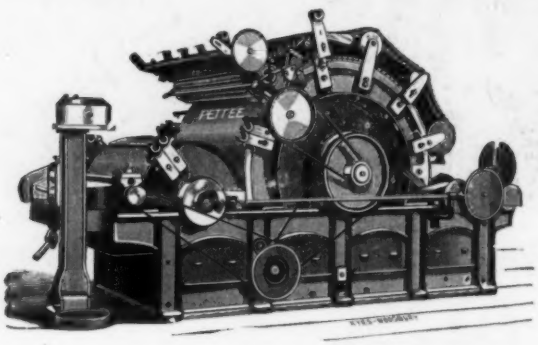

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REVOLVING FLAT CARDS,
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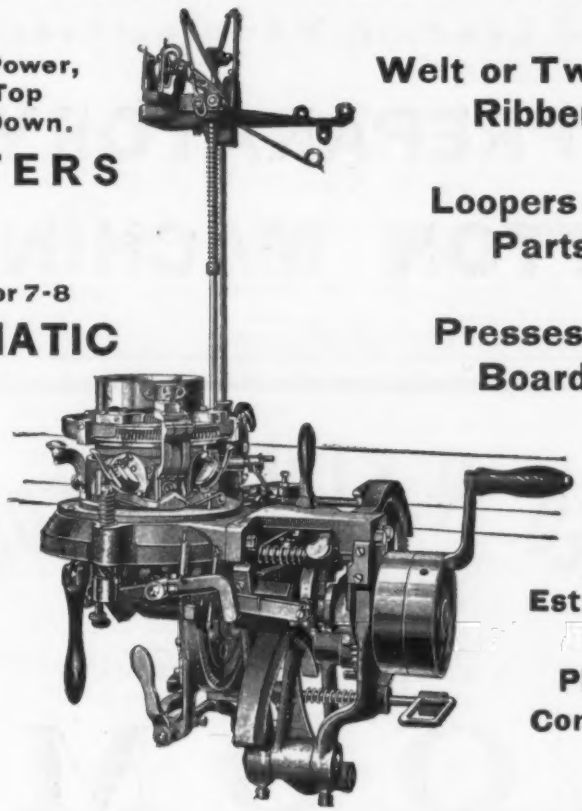
All Sizes and All Gauges.



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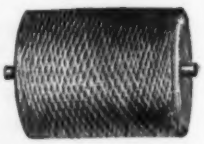
Any length, 2 1-2, 4, 5, 6, 7, 8, 10-inch traverse

For first cost, production, quality of work, and cost of winding it has no equal.



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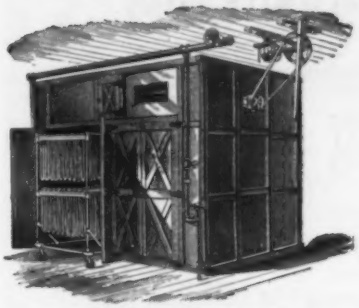

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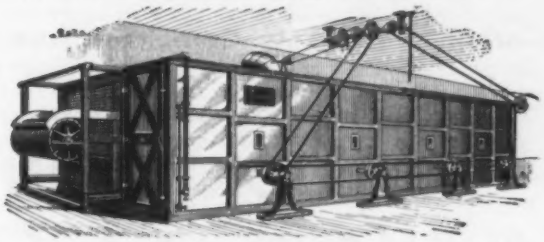

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MANUFACTURERS OF THE

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ALL STEEL THREAD BOARD

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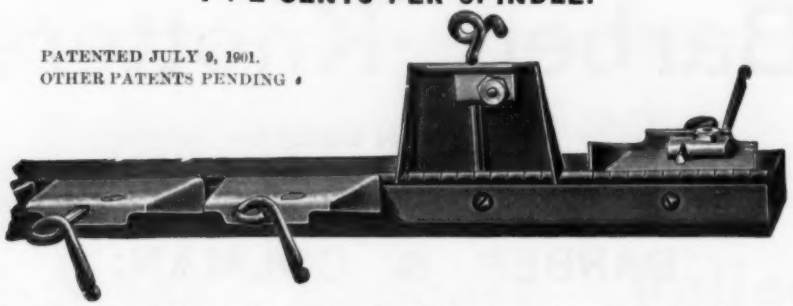
7 1-2 CENTS PER SPINDLE.

PATENTED JULY 9, 1901.
OTHER PATENTS PENDING



The only Thread Board that ***holds a guide solid*** all the time; ***never*** gets loose; is always in perfect adjustment, and thus must make a saving in travelers, broken ends, waste, thread guide, care and also prolong the wear of rings and increase the production per spindle. These claims are based on the truth of mechanical principles, and have been proven true by actual use in many mills whose superintendents will substantiate these claims.

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"With the Filter bought of you, we are saving about 10 gallons of lubricating oil per day."

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Think of it! From $1.00 to $1.50 per day saved on oil by a Cross Oil Filter which costs only sixty-five dollars.

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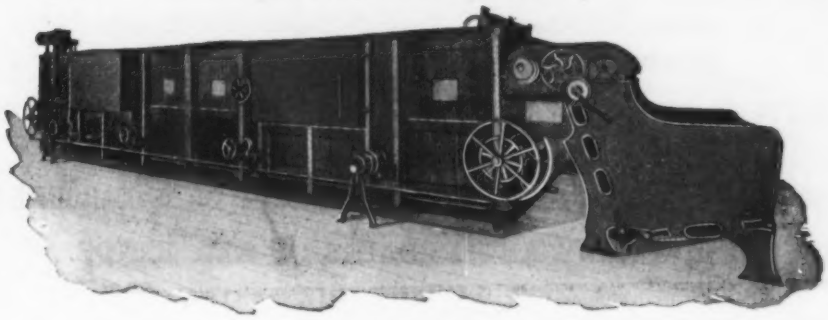

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Increases Production,
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THE BRAMWELL FEEDER (over 12,000 now in use.)
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For Second Breaker and Finisher CARDS.

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For Burr and Mixing Pickers, also Fearnaughts.

THE NEW 1902 BRAMWELL OPENER AND FEEDER,
A Complete Machine. For Wool Washers and Wool Dryers.

SOLE AGENTS FOR THE SPENCER AUTOMATIC STOCK OILER,
Send for Sheet of Testimonials. Saves Oil, Labor and Waste.

A NEW CLUTCH ATTACHMENT FOR BRAMWELL FEEDERS,
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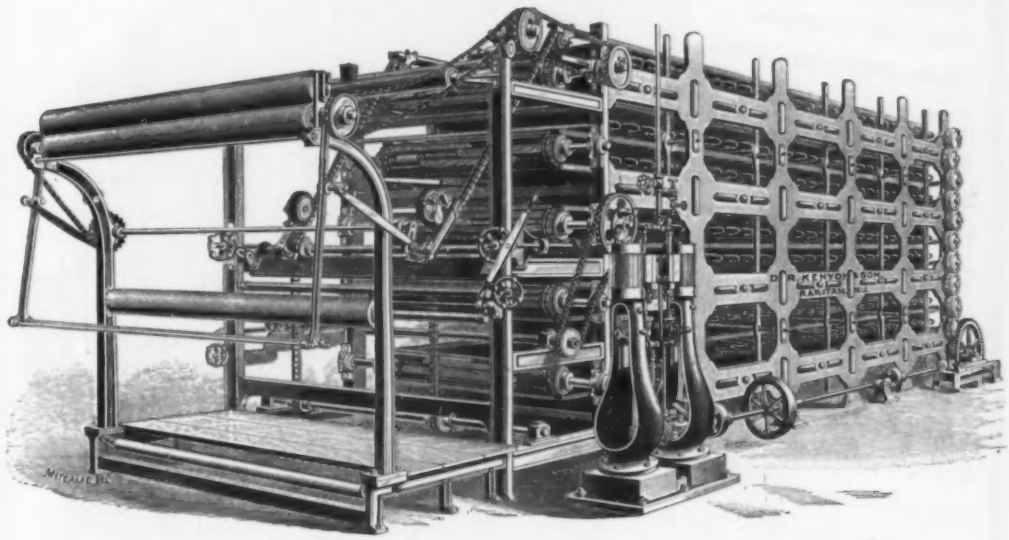
Tentering and Drying Machines

WITH LOW DOWN FEED. PATENTED FEBRUARY 26, 1895.

Tentering and Drying Machines on Pipe System. Special Dryers for Heavy Felt Goods. Hot Air Drying and Tentering Machines.



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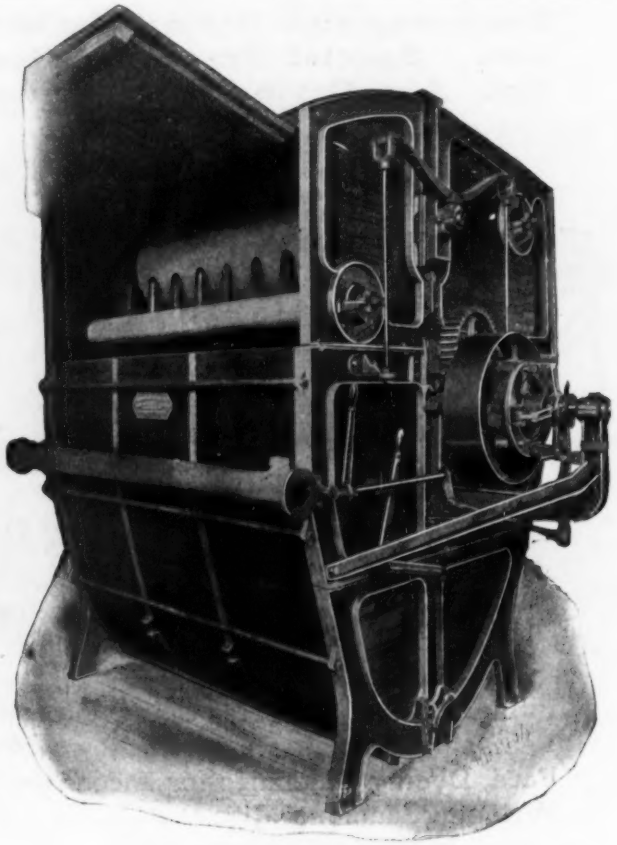
New Rotary Cloth Washer



Type C. For All Fabrics.

Improved Attachments for Fulling and Washing Knit Goods in the roll. Is fully described in Circular No. 10.

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See Descriptive Article in This Issue

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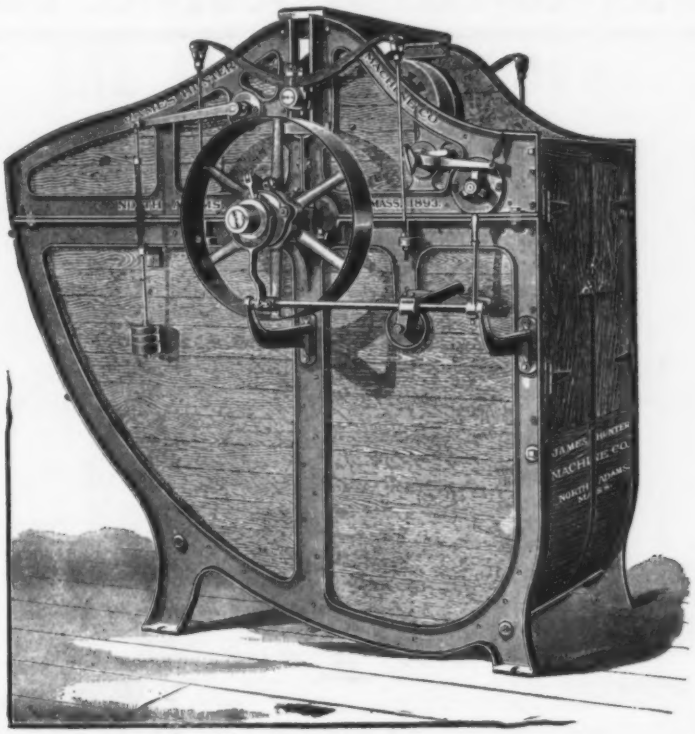
CARBONIZING MACHINERY, ETC.



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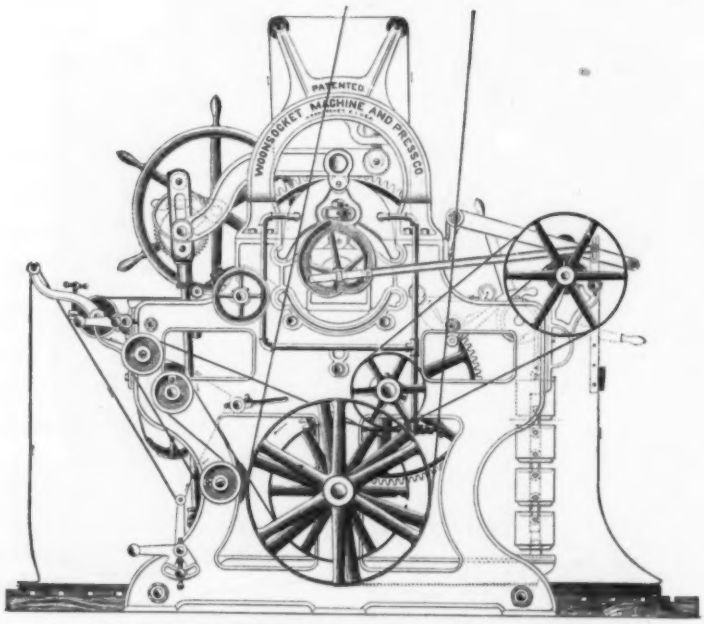
Best Patent Steam Rotary Cloth Press

Four Separate Pressings In One Machine!

The Only Press that has Self-Yielding Beds with Four Points of Contact

PERFECT TEMPERATURE, POWERFUL, SIMPLE



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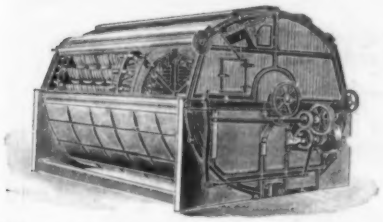

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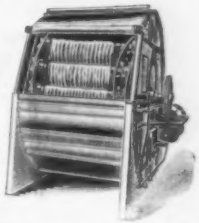
Steam and Dye Stuffs,
Perfectly Even Dyeing.

CAPACITY:
50 to 700 pounds per batch.



No Friction on the Skeins. No Tangling of the Yarn.

Universally Used.

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For Skein — Worsted, Slubbing, Cotton and Silk.
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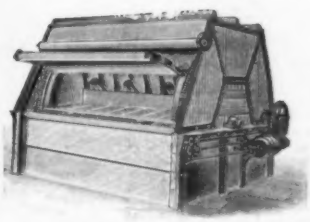
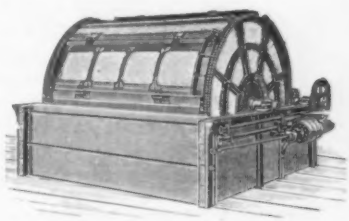


SAVES
50 per cent in Labor,
besides Steam and Dye Stuffs.
Practically Indestructible.

CAPACITY:
200 to 1000 lbs. per batch.



Leaves Stock in Perfect Condition. Does Not Mat or Tangle the Fibre.

A Perfect Machine.

OSWALD LEVER

Formerly LEVER & GRUNDY

Builders of Textile Machinery

FILLING COP WINDING MACHINES. Spindles driven by belts or by gears, and bobbins can be made to wind any kind of filling from the coarsest to fine numbers, from Skeins, Spools, Cones, Mule Cops, or any other Spinning or Twister Bobbins. These machines will put more yarn in a given size of shuttle than any other machine in use.

OUR MACHINERY PUTS YARN IN CONDITION FOR MANUFACTURING AS SHOWN ABOVE.

BANDLESS SPINDLE SPOOLING MACHINES; adapted to the finer grades of yarn and to the finest silk. ***PRESSER DRUM SPOOLING MACHINES;*** arranged to spool in any way the trade requires. ***BANDLESS VARIABLE SPEED MACHINES;*** to wind the large bobbins used in knitting mills; these machines can be arranged to wind cops or butts from the largest used in any weaving to the smallest cops or butts for cotton filling used in the silk trade. ***CONICAL AND STRAIGHT TUBE WINDING MACHINES, BRASS BOBBIN WINDING*** and other machinery for lace mills. Beaming Machines, Sectional Warp Mills, Chenille Cutting Machines, Reeling Machines to prevent waste at the bottom of mule bobbins.

Lehigh Ave. & Mascher St., Phila., Pa.

The Fact is Wyandotte Washing Soda

is Meeting with Marvelous Success with the Mill Trade

HUDSON RIVER WOOLEN MILLS.

New York Office, 20 White St.,

THE J. B. FORD CO., Wyandotte, Mich.

Gentlemen: Newburg, N. Y.

We do not make a practise of writing "testimonials" for supplies used in our mill, but we are going to make an exception of Wyandotte Washing Soda as it is a case of unusual importance to us.

A few months ago we were persuaded to give Wyandotte Washing Soda a trial for scouring wool. After a little experimenting, we found the right proportions to use with our water and since then, we have turned out a prettier grade of wool and finished goods than we ever had before.

After our satisfactory results with the wool, we tried using it with our soap, for washing finished goods. This was equally successful. We can truly state that we consider Wyandotte Washing Soda the most valuable scouring compound ever introduced in our mill.

Very truly yours,

HUDSON RIVER WOOLEN MILLS,

L. P. Gillespie, Supt.

WAYNE JUNCTION SPINNING CO.,

Manufacturers of Worsted and Woolen Yarns,

Wayne Junction, Phila, Pa.

THE J. B. FORD CO., Wyandotte, Mich.

Gentlemen:

We are using your Wyandotte Soda and are pleased to say that it is giving very satisfactory results by making the wool whiter and more lofty.

Very truly yours,

WAYNE JUNCTION SPINNING CO.,

Order from one to five barrels from your supply house. Give it a thorough trial, if not all we claim for it return the unused portion at our expense. A trial will cost you nothing.

Not Genuine except with This Trade Mark

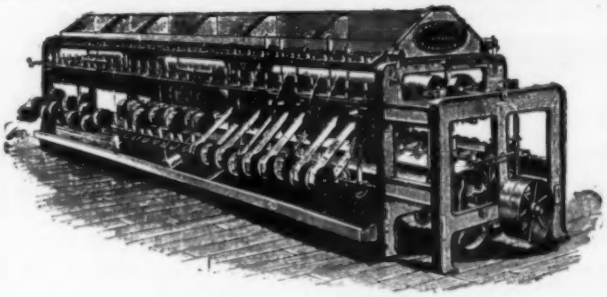
In Every Barrel.

The J. B. Ford Co. WYANDOTTE, MICH.

Telegraphic Address: "WHITELEY, HUDDERSFIELD." Nat. Telephone, 598 and 599.

Wm. Whiteley & Sons Ltd.

LOCKWOOD, HUDDERSFIELD.



CONE PIRN WINDER.

MAKERS OF ALL DESCRIPTIONS OF

Woolen Machinery

Makers of all descriptions of

TENTERING AND DRYING MACHINES,

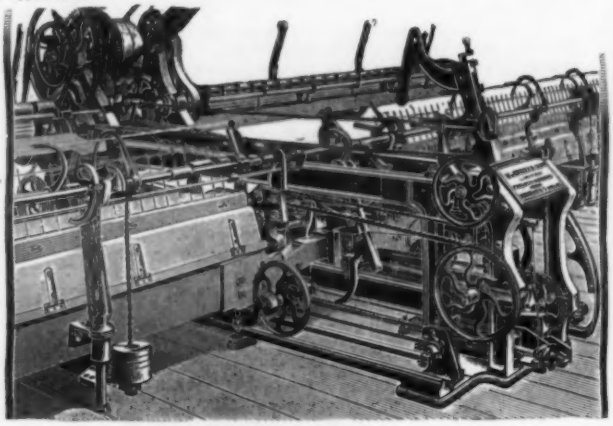
MOORE & WHITELEY'S PATENT WOOL and COTTON DRYER,

CRABBING OR WINDING-ON FRAMES,

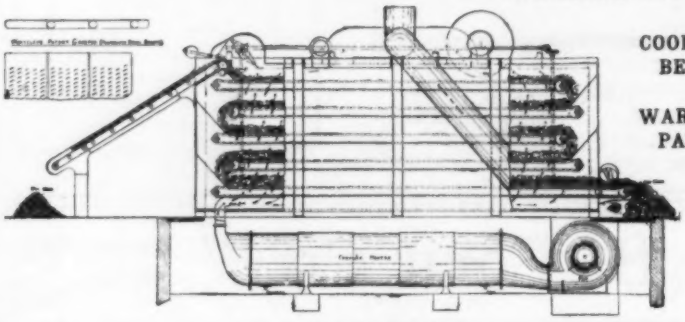
CROSS RAISING MACHINES, WOOL SCOURING MACHINES,

HYDRO EXTRACTORS,

WARP SIZING,



SELF-ACTING MULE.



WOOL DRYER.

COOL AIR DRYING AND BEAMING MACHINES,

WARPING MILLS WITH PATENT SECTIONAL DIVIDING APPARATUS,

SELF-ACTING MULES,

BOBBIN or PIRN WINDER, &c., &c.

WILLIAM FIRTH, Pres. *The* FRANK B. COMINS, Treas.

AMERICAN MOISTENING COMPANY

Received the **HIGHEST AWARD** on recommendation of the FRANKLIN INSTITUTE for

"Simplicity and Originality of Design."

Is the largest manufacturer of **HUMIDIFIERS** in the World. The last twenty years receiving the **HIGHEST AWARDS** in this country and Europe for its **Air-Moistening System. Eight Gold Medals** and others as follows:

Industrial Exposition, LILLE 1902.

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The Only Perfect System of Air-Moistening

And Has Been Adopted by the Representative Manufacturers of this Country

THE ONLY SYSTEM ADOPTED IN THE TEXTILE SCHOOLS

COSTS LESS TO OPERATE

than any other system on the market. Has given satisfaction where other devices have failed.

EQUITABLE BUILDING, BOSTON, MASS.

WRITE FOR BOOKLET "T" ON HUMIDIFICATION.

Legal Proceedings will at once be taken against infringers and users of infringements.

J. S. COTHRAN, Southern Representative, Empire Bldg., ATLANTA, GA.

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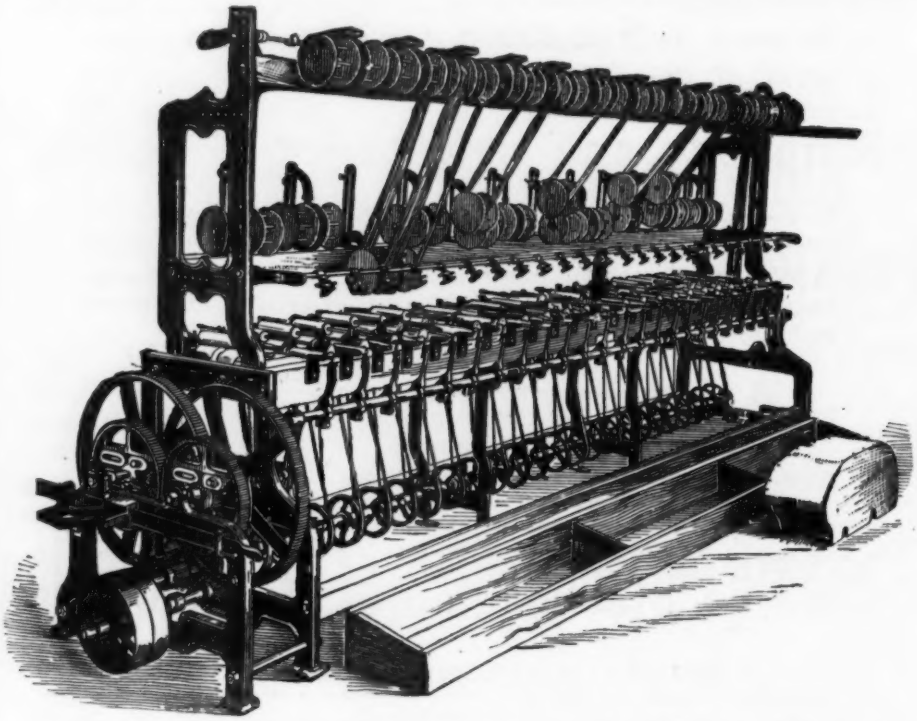
FOR SHUTTLE BOBBINS, WITH VARIABLE MOTION



YOU HAVE THE SKEIN YARN; HERE IS AN UP-TO-DATE SKEIN WINDER TO HANDLE SAME TO BEST ADVANTAGE. LET'S GET TOGETHER!

This winder is especially adapted for Mercerized Yarn or the finest counts of Cotton, Woolen or Worsted Yarns. High speed; rapid production; best quality of work. Guaranteed to make hard, smooth bobbins, which will produce **SMOOTH** cloth. Also Build a Line of

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FULL PARTICULARS ON APPLICATION.

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THE BEST SYSTEM IN THE WORLD FOR WINDING FIBRE AND WIRE.

NO KINKING.
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NO VARIATION IN TENSION WHILE UNWINDING.
NO REWINDING REQUIRED.

"UNIVERSAL"

The Best Winding Machine in the World.

High Speed, Great Durability, Interchangeable Parts, Perfect Tension, Easy to Operate.

UNIVERSAL WINDING COMPANY

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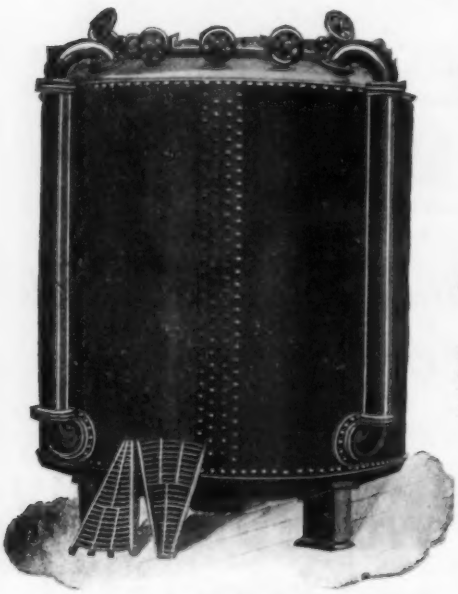
Worcester Steam Boiler Works,



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Manufacturers of TUBULAR, MANNING and Other Styles of

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SMOKESTACKS and HEAVY SHEET IRON WORK.

SPECIALTIES:

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KIER

Embodying every improvement suggested by our own long experience in building Kiers, as well as the experience of the leading bleacheries in the country who are using our machinery. Built in all sizes.

Also STEAM BOXES for Yarns, Print Goods, etc.

WILLIAM ALLEN & SONS CO.,

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65 Green Street, WORCESTER, MASS.

Send for Circular and Prices.

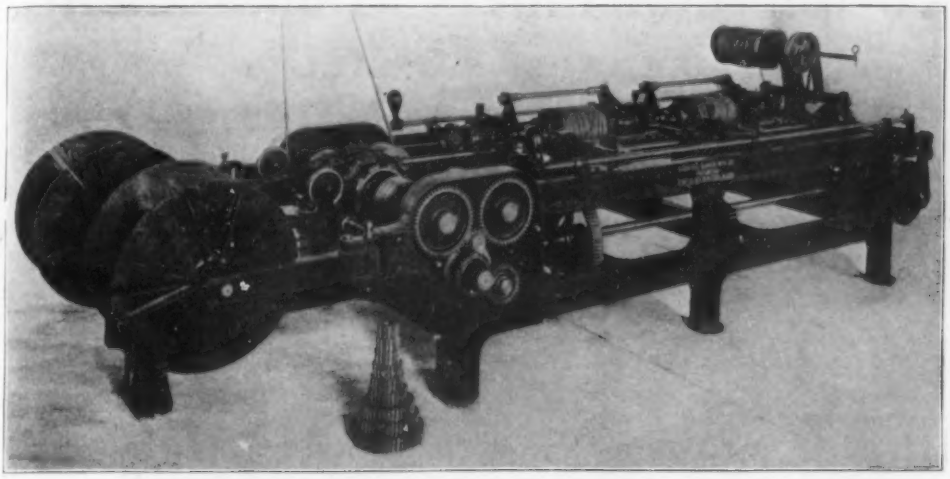
THE HASKELL-DAWES MACHINE CO.

Manufacturers of the best types of

Forming, Twisting and Laying Machinery

Which are adapted for making all kinds of

COTTON CABLE-LAID TWINE, CORD and ROPE



The Haskell-Dawes Machines are built upon a NEW PRINCIPLE, whereby the MOST POSITIVE RESULTS ARE SECURED. They occupy LESS SPACE than the ordinary type of machines, require LESS RELATIVE POWER, and will turn out a MUCH LARGER PRODUCT of Twine and Rope. The SPECIAL ATTENTION of Cotton Manufacturers is called to our new FORMING AND ROPE-LAYING MACHINES. Descriptive Catalogue Sent on Application.

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BRAIDING MACHINERY

ALL STYLES AND KINDS FOR FLAT AND ROUND BRAIDS.

SOLID SASH AND CURTAIN CORDS,

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AND ALL BRAIDED FABRICS.

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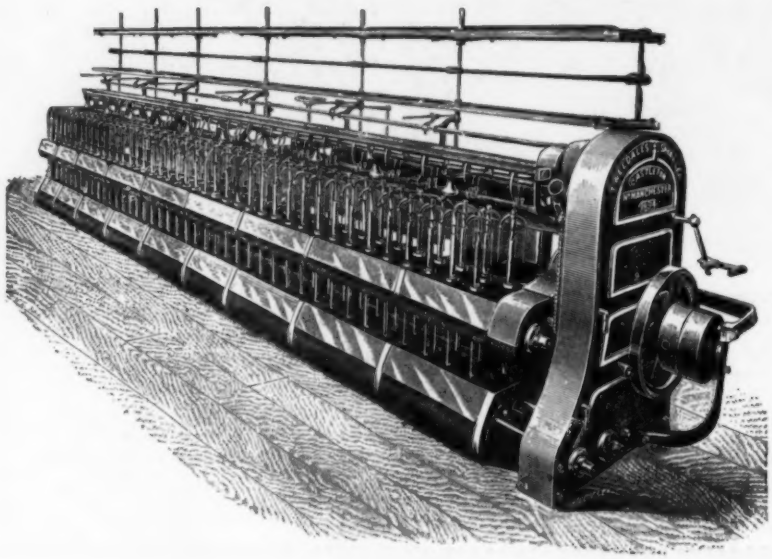
Cards **Drawing Frames** **Speed Frames**

TAYLOR, LANG & CO., Ltd., Self-Acting Mules.



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Distilled products recovered from Yorkshire Grease. Distilled Oleines for Woolen and Worsted Mills. Distilled Stearines, hard and soft greases for tanners, oil compounders, etc.

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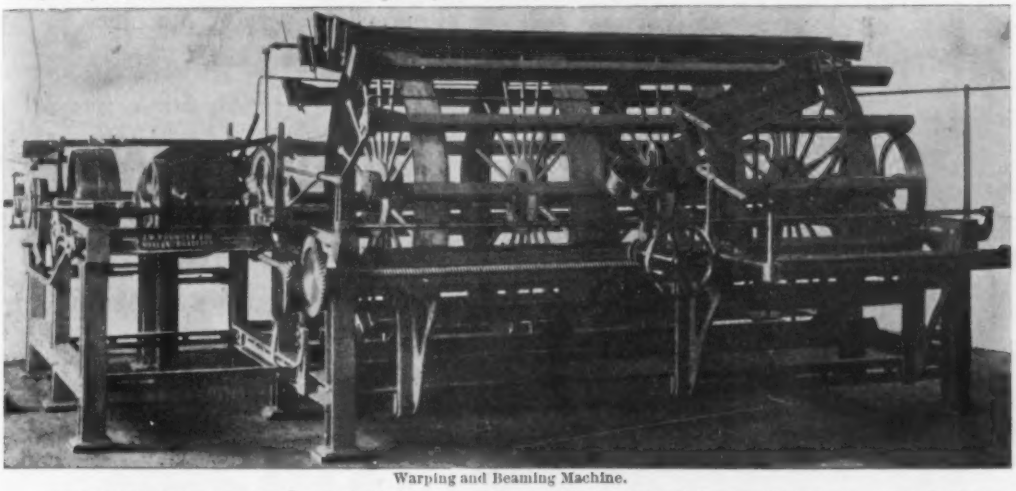
Telephone, No. 2132 Bradford. Telegrams, "Machines, Bradford." W. U. T. Code used.



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Estimates and Plans prepared for complete Piece or Warp Bleaching, Dyeing and Finishing Works.

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—MAKERS OF—

MACHINERY FOR

Preparing and Spinning Flax, Tow, Hemp and Jute,

—AND OF—

SPECIAL MACHINERY FOR THE MANUFACTURE OF TWINES,

—ALSO OF—

Good's Combined Hackling and Spreading Machine.

Automatic Spinning Frames, Improved Laying Machines; and other Special Machinery for the Manufacture of Rope Yarns.

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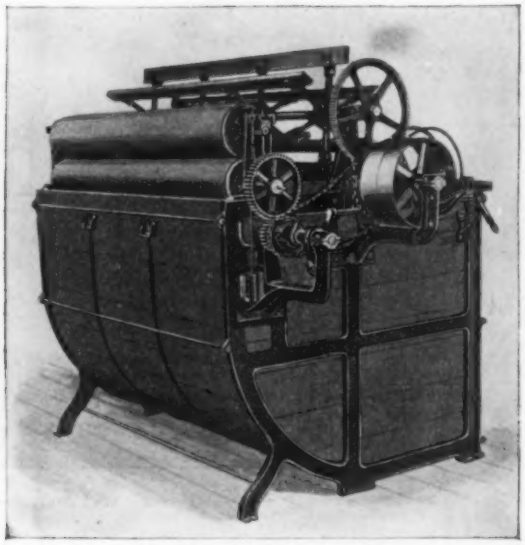

1903 PIECE DYEING MACHINE.

FULLING MILLS

Piece Dyeing Machines,
Dye Tubs, Vats,
Tanks, etc.

HOPKINS MACHINE WORKS

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Our machines are up to date.
Patented features found in no others.
Most effective and economical machines built.

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HAVE YOU SEEN **BOYD'S** Patent Worsted Spinning Frames?

They Spin Better and Take Much Less Power to Drive than any of the other Spinning Frames in use

BOYD'S Patent Stop Motion Twisters
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FOR ALL KINDS OF FIBRES

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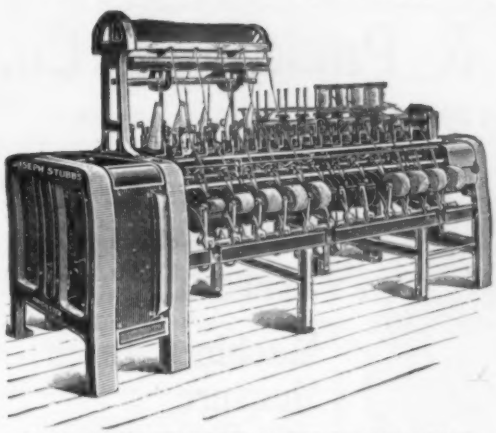
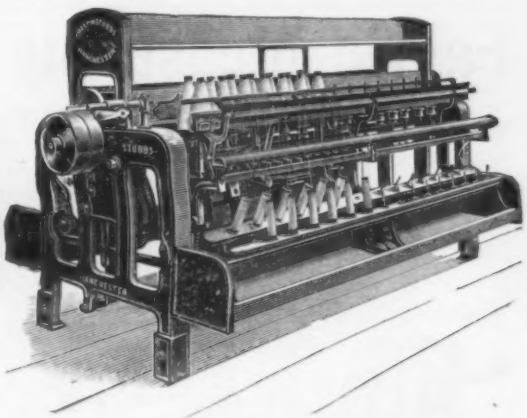
For Winding Gassing, Reeling, Preparing, Polishing and Bundling Yarns.



PATENT QUICK TRAVERSE COTTON GASSING FRAME.



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With Patent Tapering Motion, for Single Flanged Bobbins.

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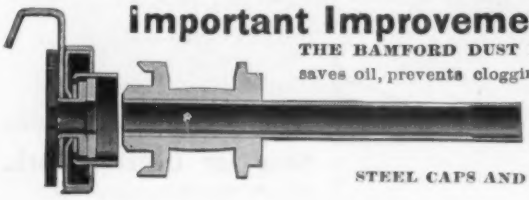

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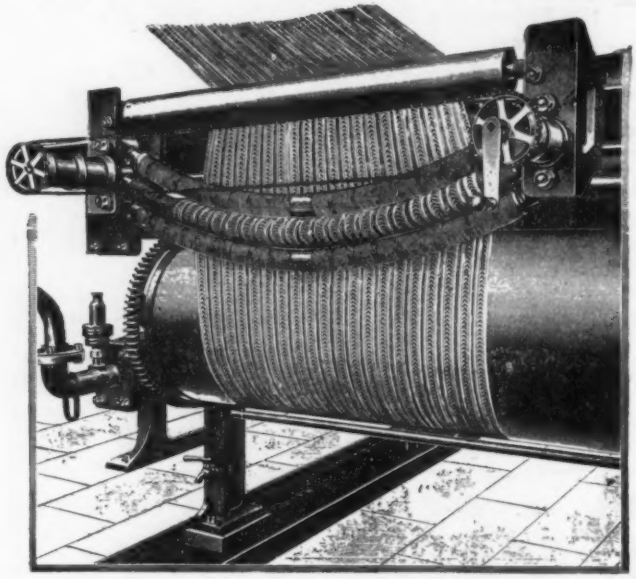

The recent invention of Wm. Mycock, an English cotton manufacturer. Hundreds sold in Great Britian and on the Continent. Large bleacheries in this country where it has been placed on trial are delighted with it. Gets the full width of goods, with perfectly even tension both ways. Can be attached to calenders or cans. Put it on trial.

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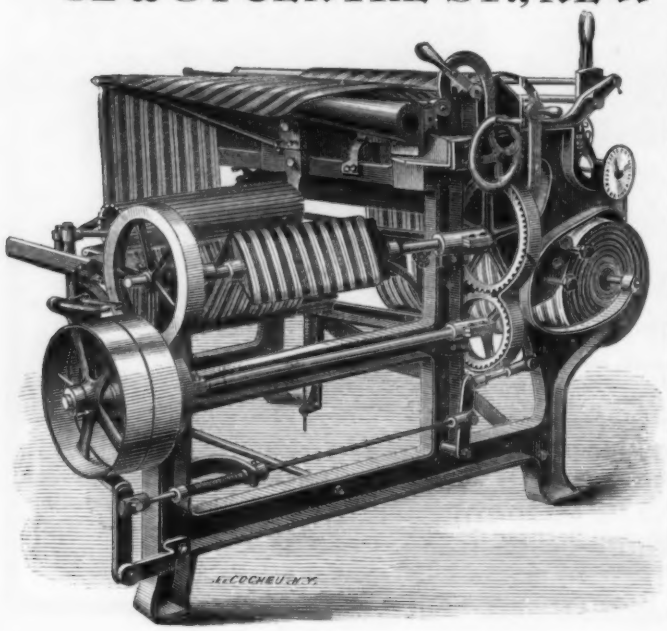

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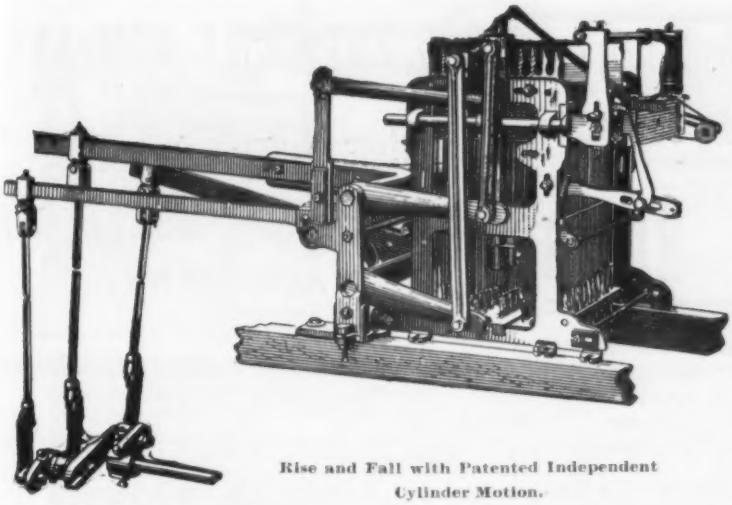
On Cottons, Woolens and Carpets.

Machines to Measure

and imprint the measurement upon fabrics, fold lengthwise and roll into merchantable packages all in one operation.

Prevents claims for short measure.
Marks piece numbers on each package.

A Fully Equipped Machine Shop for General Work.



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"The Best Machine on the Market"

Original Fine Index Machines

Single Lift, Double Lift, Double Cylinder, Rise and Fall, Crossborder.

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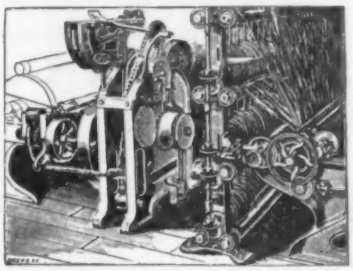

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TORRANCE PATENT **AUTOMATIC BALLING MACHINE**

With all the latest improvements for Wool Cards. The latest and best and only Feed that will make yarn positively even.

ALSO

Builders of CHOQUETTE WASTE SAVING and CLEANING DEVICE.

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Cloth Finishing Machinery

For Cotton, Woolen, Worsted, Plush Goods, Etc. Shearing Machines a Specialty.

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Send for Descriptive Catalogue.

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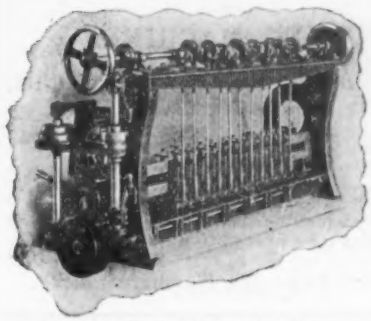

Standard Horse Blanket Machine.

L. F. FALES,

Manufacturer and Builder of

Multiple Needle Sewing Machines,

For Sewing Carpet Lining, Horse Blankets, Wadding, etc.

These machines can be built with any required number of needles.

SPECIAL MACHINERY DESIGNED AND BUILT.

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MANUFACTURERS OF

Metallic Rolls

Especially adapted for Cotton Mills. 25 to 33 per cent more Production Guaranteed. Weight Reduced 33 to 50 per cent. No Leather Covering Bill.

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Send for new circular telling how to get perfect work in this department.

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Maker of

Worsted Machinery,

For Preparing, Finishing Gills and Drawing Boxes

New Screws made and old ones repaired and thoroughly case-hardened

Repairs and new parts for curled hair machinery. Fallers of every description made. Change Gears, 5-8, 7-16, 3-8 and 1-4 inch pitch kept on hand. All kinds of new Fluted Rollers, for Combs, Gills, Drawing and Spinning; also Refluting old ones. Improved Roller Covering Machine.

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And All Kinds of Expansion Combs, for Warpers, Beamers, and Slashers.

ALSO TRAVERSE WHEEL AND ROLL GRINDERS for American or English Cotton, Woolen or Worsted Cards.

Particular attention given to the Repairing of Grinders of all makes for Cotton Woolen or Worsted Cards.

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MANUFACTURERS OF

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Thread and Yarn Reels
Improved Thread Dressers

Yarn Printing Machines for Warp or Skein, Belt Cutters, Scarfing Machines.

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BUILDER OF

IMPROVED SPINNING AND TWISTING MACHINERY

FOR HARD OR SOFT TWINES, LINES, CORDAGE, ETC.

Of Sisal, Manila, Cotton, Linen, Hemp, Jute, Silk, Hair, Paper, or Wire.

Write for particulars in regard to our new machine for spinning heavy Cotton Yarn direct from Drawing Sliver for Cotton Rope, etc.

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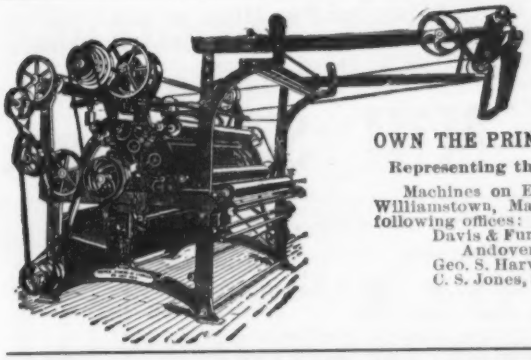

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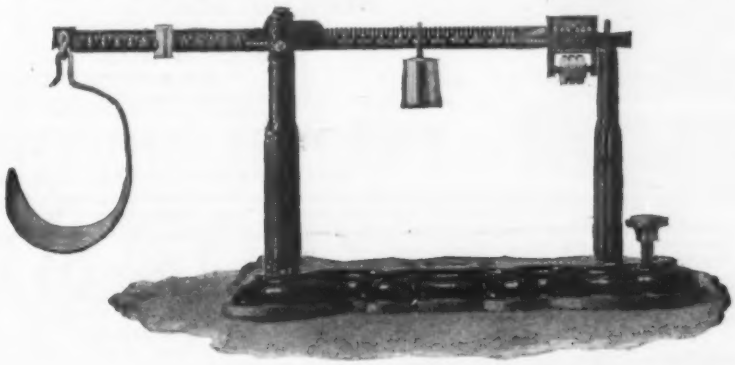

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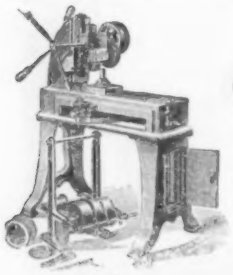

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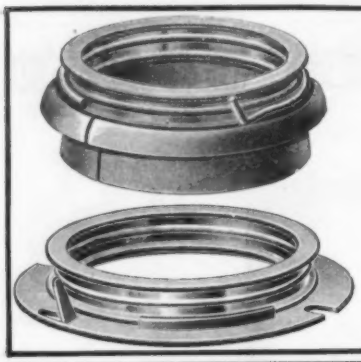

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Daylight Dark Rooms
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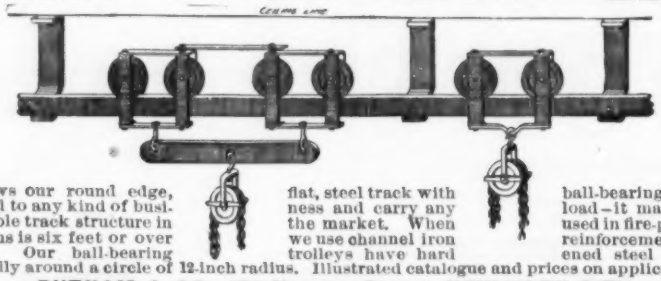
OVERHEAD CARRYING TRACK.



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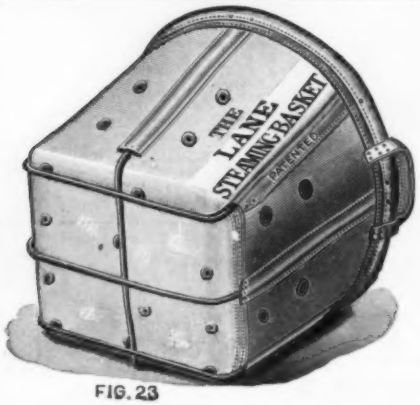

FIG. 23

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Are replacing all other kinds where hard usage is given and where **lightness, strength, durability** and **cheapness** are a consideration. Some of the comparative results in big mills are remarkable. Send for our booklet. We make all styles and shapes for every kind of mill use.

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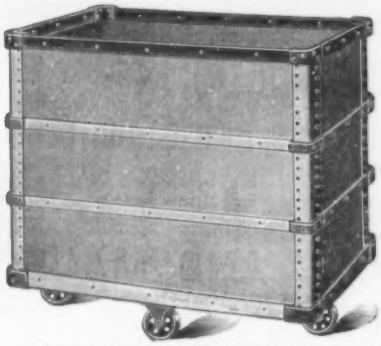
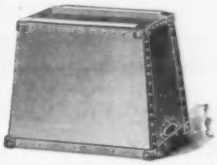
The "20th Century" Laminar Can.

Laminar Taper Box with hardwood shoes. Top View.



Laminar Car or Truck with Corners and Steel Top Rim.



Laminar Taper Box with hardwood shoes. Bottom View.

Vulcan Fibre Roving Can.

BODY—Vulcanized Fibre. SIDE SEAM—Riveted with Patented Clinched Rivets. RINGS—Tinned Steel, Brazed Joints, Curled Edges. BOTTOM—IXXX. Tin Star Corrugation; Fastened without the use of nails or screws, will not crack, warp or shrink and cannot come out. FINISH—Coated inside and out with moisture proof coating, handsome and smooth. WEIGHT—About one-half pound per inch diameter. SIZE—All cans to any exact size, perfectly round and true. DURABILITY—Superior to any other can.

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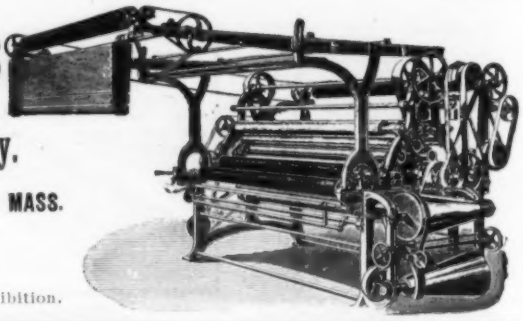

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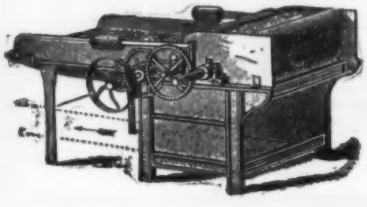

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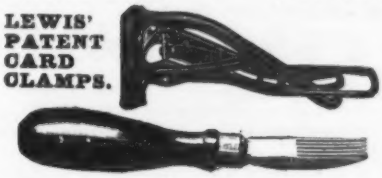

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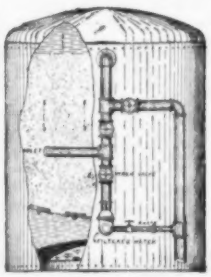

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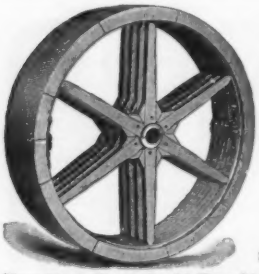

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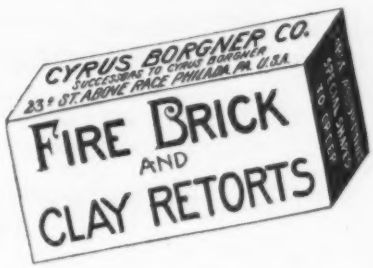

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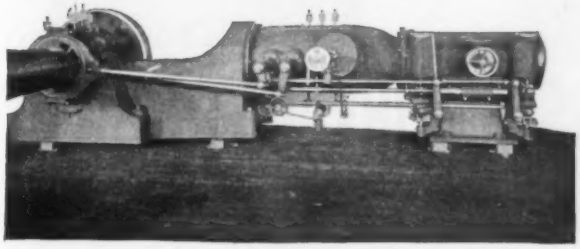

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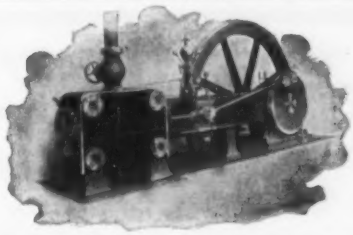

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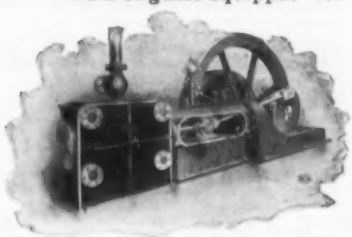

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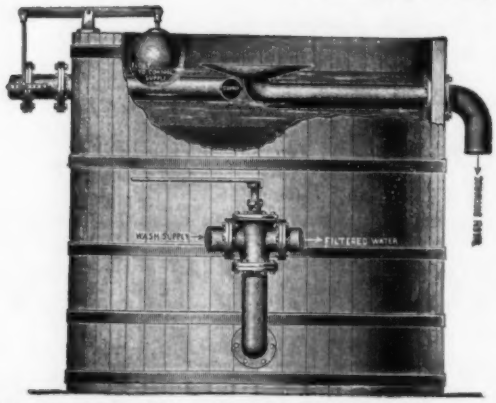

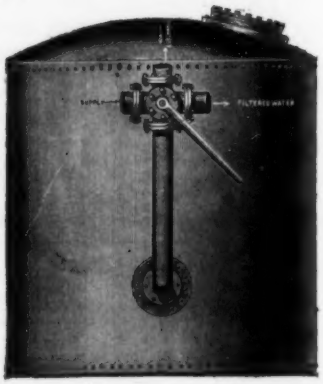

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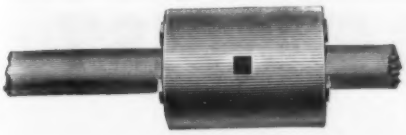

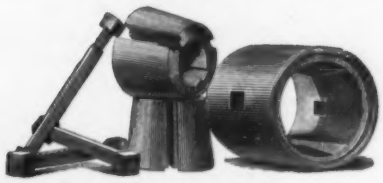

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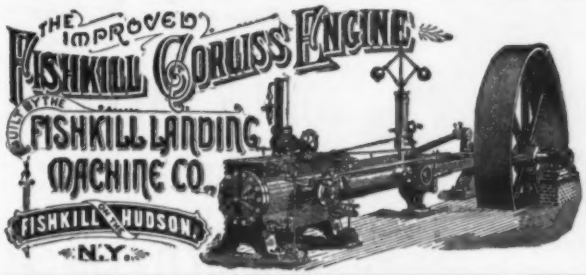

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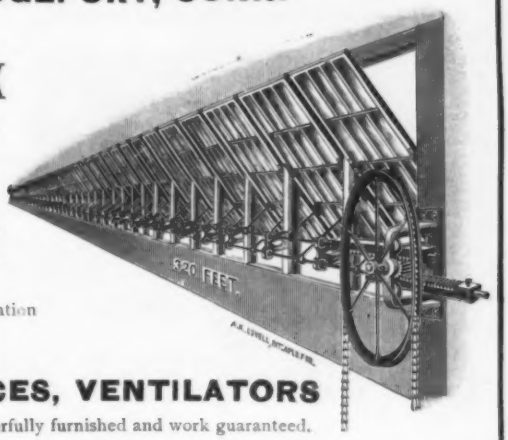

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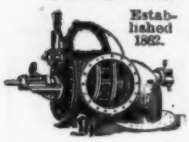

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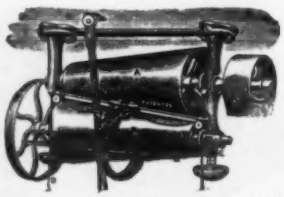

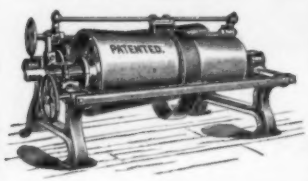

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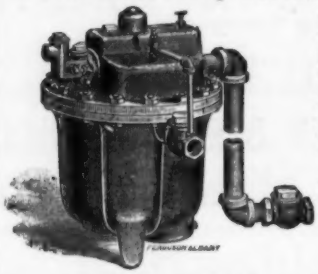

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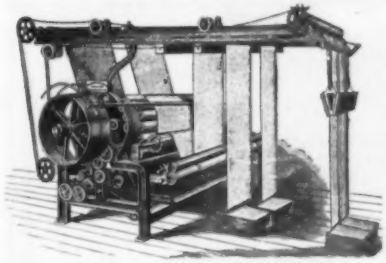

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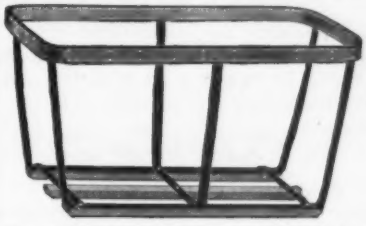

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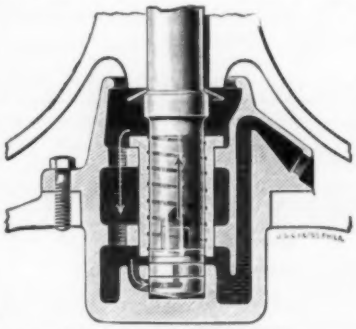

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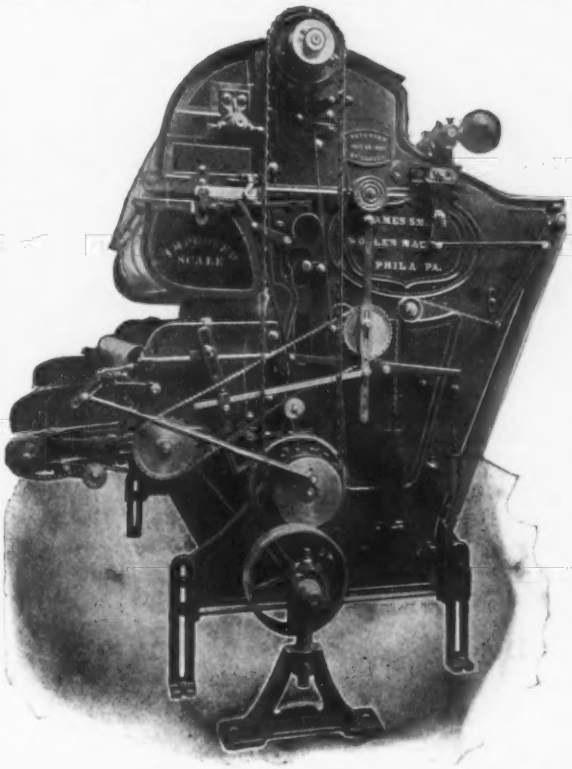

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Date of Publication.

THE TEXTILE WORLD RECORD IS PUBLISHED MONTHLY ON THE 12th OF EACH MONTH.

Copy for regular advertisements must reach publication office by the 25th of month preceding date of issue to insure proper attention. Transient ads., Wants, For Sale, etc., to go on Classified pages can be taken up to the 4th of the month of publication.

We are always pleased to co-operate with advertisers in preparing attractive advertisements, and strongly recommend frequent change of copy, which increases the interest, and, therefore, the beneficial results of the advertising. We will cheerfully change copy as often as may be desired, providing it reaches us in time, but we cannot promise changes for next issue unless received as above stated.

The Official Directory of the Textile Industries of the United States and Canada,

is published annually in the spring by LORD & NAGLE CO. It is a book of about 500 pages, well printed and bound. Office Edition $2.50. Traveler's Edition, $2.00.

PART I. Contains a complete directory of all the textile establishments in the United States and Canada. It tells what goods are made, the number of sets of cards, spindles, looms, whether and what they dye or finish, steam or water power, who the selling agents are, the names of the officers, superintendent and buyer.

There are 22 textile maps; gives population of town and railroad connections.

PART II. Is the Yarn Trade Index, containing classified lists of yarn spinners, arranged according to kind of yarn, size and number spun, etc. All the mills with worsted machinery are included in this section.

PART III. Contains Classified List of mills doing order and commission work, also dyeing, finishing, bleaching and printing establishments, classified according to the kind of work done, and so far as possible giving width of goods handled; also shoddy, extract and flock manufacturers and wool scouring establishments.

PART IV. Manufacturer's Selling Agents and Dry Goods Commission Merchants, giving the name and address of concern, character of goods handled, different departments, with managers, list of manufacturing clothiers, and suit and cloak manufacturers, giving specialties and buyers names. A list of city offices of textile mills is given.

PART V. Dealers and Brokers in raw materials and stock, including wool and shoddy dealers and brokers, cotton dealers and brokers, factors and buyers and wholesale rag dealers making a speciality of textile interests.

PART VI. Buyers Index of Textile Machinery and Supplies, and statistics showing textile machinery in the United States, giving spindles, looms, knitting machines, etc.

Foreign Advertising Bureau.

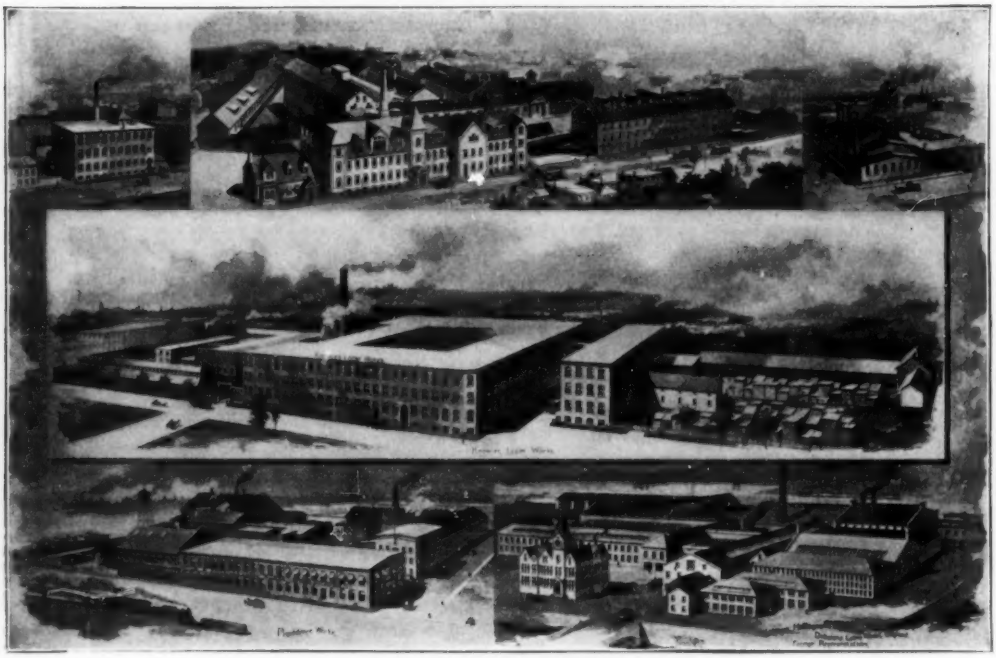
We are in close touch with all foreign textile journals and have their advertising rates on file and act as their agents for receiving advertisements and subscriptions. Any American textile advertisers wishing to advertise in Great Britain or the Continent may do it through our Foreign Bureau, which will advise as to best papers to use for different purposes, estimate the cost, prepare a correct technical translation into the foreign language, and attend to all details, correspondence, etc., including the payment of bills, so advertisers will have no more trouble than if placing an ad. in the TEXTILE WORLD RECORD.

CROMPTON & KNOWLES

LOOM WORKS.

WORCESTER, MASS.

Works: Worcester, Providence, Philadelphia.



Builders of **LOOMS** *for every fabric.*

Dobbies, Jacquard, Combs, Drums.

Carpet and Rug Looms are now built at our works in Philadelphia.

Foreign Representatives, Hutchinson, Hollinworth & Co.

DOBCROSS, ENGLAND.

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Correspondence.

We solicit correspondence on textile subjects. Articles accepted will be paid for. Name and address must always be given, not necessarily for publication. Subscribers are invited to make free use of our Questions and Answers Department; correspondence is strictly confidential.

Textile and Technical Books.

We sell all textile books at publishers' prices. We publish technical books, especially on textile subjects and make liberal arrangements with authors.

HOWARD & BULLOUGH,
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PAWTUCKET, R. I.

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65 FRANKLIN ST.

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814-815 EMPIRE BLDG., ATLANTA, GA.

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TEXTILE WORLD RECORD

COMBINING

The Textile World and Textile Record.

VOL. 25. (NEW SERIES.) APRIL, 1903 No. 1.

ANNOUNCEMENT.

The Textile World and Industrial Record, published by Guild & Lord of Boston, and the Textile Record of America, published by the Textile Record Co. of Philadelphia, have been consolidated, and will hereafter be published as one journal under the name of the TEXTILE WORLD RECORD.

The Lord & Nagle Company, of Boston and Philadelphia, incorporated with a capital stock of $100,000, succeeds to the business of Guild & Lord and the Textile Record Company, including not only the Textile World Record, but all the other publications, directories, etc., of both concerns. Frank L. Nagle is the president and Henry G. Lord, the treasurer.

This company unites the two leading publications devoted to the processes of textile manufacture. No effort or expense will be spared to produce a journal equal to any of the great trade journals of the world and worthy of the textile industry.

The combined circulation of the two publications includes almost every textile establishment of any size in the United States and Canada, as well as a very considerable foreign circulation.

Its advertising patronage includes nearly every prominent builder of mill machinery and dealer in mill equipment and supplies in this country. The work of consolidation has necessitated calls upon hundreds of customers, and it has been a source of great gratification to learn of their cordial approval of this step, which reduces the number and improves the quality of textile periodicals.

The subscription price will be $2.00 per year, or in combination with the Annual Official Directory, $3.00 per year. Those who have been subscribers to both publications will have their subscriptions extended or otherwise adjusted in a satisfactory manner.

Samuel S. Dale of the Textile World will be the editor. E. A. Posselt of Philadelphia, who has conducted the technical processes department of the Textile Record, will continue to conduct that department. The amount of reading matter has been increased about 40 per cent. It can be imagined that the readjustment of business and preparation of a large magazine like this, of a size different from either the former Textile World or Textile Record has been a task of great magnitude, and in the short time available, some features are not yet in their perfected shape, but we think the trade can form an idea from this number of what the publication is intended to be and the general lines upon which it will be conducted.

The Boston office of the Textile World at 95 South Street and Philadelphia office of Textile Record at 425 Walnut Street will be

the main offices, with branches at 123 Liberty Street, New York, and 115 Dearborn Street, Chicago.

The former business representatives of the two concerns continue with the Lord & Nagle Company. John D. Nagle is at the Philadelphia office, M. A. Metcalf will make his headquarters at the Boston office and A. H. Tyler at the New York office. E. T. Gundlach is Western representative. An office will soon be opened in the South.

The entire organization will work to produce a textile journal which will give unrivaled value to both subscriber and advertiser and which will be truly, as its name implies, a "Textile World Record."

LORD & NAGLE COMPANY.

FRANK L. NAGLE, President. HENRY G. LORD, Treasurer.

Boston, April 1st, 1903.

The business of Guild & Lord, including the publication of the Textile World and Industrial Record, the Annual Official Directory of the Textile Industries, Textile Advance News, Dyer's Supplement and the publishing of textile books, has been transferred to the Lord & Nagle Company. As stated in the preceding announcement, the personnel of the editorial and business staff remains unchanged.

The Textile Record and the Textile World have been honorable competitors for many years, and it is believed that their consolidation will result in the publication of a better journal than either, and in benefit to the trade and to the publishers.

The firm of Guild & Lord was formed in 1887. The first issue of the Textile World was published in January, 1888. In fifteen years the Textile World has undergone many changes. Starting as a 4-page blanket sheet, with a subscription price of 50 cents per year, it closes its career as a magazine of 208 pages at $2.00 per year. On the books today are subscribers and advertisers who have been continuous patrons during this entire period.

In January, 1897, the Textile Manufacturers' Review and Industrial Record, which was the first textile paper and among the first trade papers established in the United States (1868), was combined with the Textile World. The Industrial Record previously combined five other textile publications.

The firm was originally composed of Walter B. Guild and Henry G. Lord, and remained unchanged till 1895, when Mr. Guild withdrew and Bertram Lord was admitted to partnership, retiring in 1899, since which time Henry G. Lord has been the sole member.

In behalf of his former partners and himself he desires to express his appreciation and thanks for the staunch support extended to the firm for so many years, and trusts that the same cordial relations will be continued with the new company.

Guild & Lord,
Henry G. Lord.

Philadelphia, April 1st, 1903.

The first number of THE TEXTILE RECORD appeared in September, 1880, and for twenty-two years and six months the journal has been the faithful representative of the textile industries of the United States and the unflinching champion of that policy of tariff-protection under which those industries have grown to greatness and the nation has taken the first place among wealth producers. Consolidation of the Textile Record with its able and progressive competitor the Textile World has been effected for some of the reasons that have impelled successful companies in other departments of business to join forces. The strength of both journals is concentrated in one, and thus the power to serve the textile interests has been increased, if not quite doubled. The new journal, the Textile World Record is today as well-equipped for the performance of its functions as any technical publication in the world; perhaps better equipped.

Two of the officers of this company, Messrs. Frank L. and John D. Nagle go with the new company. The third one, long the editor of the Textile Record, wishes to bear testimony to the faithfulness of the Messrs. Nagle in all the years of the Textile Record's existence, to express his gratitude to the textile manufacturers who have stood by him resolutely while he was fighting for their interests and those of the nation, and to ask

for the Textile World Record and its directors the continuous support and approval of these manufacturers. The editor of the Textile Record retires from this part of the industrial and economical field, assured that the work of promoting the textile manufacturing interests of the nation is in the hands of fit men.

CHARLES HEBER CLARK,
President Textile Record Co.

Monthly Comment.

Export Trade in Knit Goods.

While the United States exports no knit goods Germany is exulting over the size of her own export trade in this line, which amounted in 1902 to a round one hundred million marks, the details of which are given in another part of this issue.

It is interesting and may be profitable to our own knitters, to study the classification and destination of the large volume of German knit fabrics sent to other countries last year. The goods were divided as follows:

Cotton knit goods	56%
Cotton gloves	15%
Woolen hosiery	22%
Silk hosiery	3½%
All other	3½%

Cotton goods valued at $16,000,000 form over 70 per cent. of the total. The cotton for the finer grades was grown in Egypt, spun in England and then sent to the German knitters to be converted into these goods. The larger part of the cotton goods that make up this 70 per cent. was made from cotton raised in the United States, and sent to England or Germany to be spun, finding its way in the form of yarn to the German knitting machines, and then in the form of knit garments to foreign countries, over one-quarter of it actually reaching the United States in spite of our tariff barriers against imports. What better proof of Germany's superior facilities for manufacturing knit goods can be found than a Southern cotton planter wearing cotton hosiery "made in Germany" from cotton raised on his own plantation the year before?

The destination of these German knit goods suggest equally interesting reflections. The United States stand not very proudly at the head of the list, having taken nearly 30 per cent. of the cotton knit goods with a self imposed tariff tax of about 50 per cent. Great Britain stands next, having taken but 19 per cent. of the same line, although no tax was imposed on her purchases. Other Europe took 16 1/2 per cent. South America, Central America, Mexico and the West Indies combined come in for about 14 per cent., valued at about $1,800,000.

We hear a great deal about the foreign trade of the world, but to the foreigner that trade, in knit goods at least, is largely a trade with Europe and the United States.

Canada's Low Tariff.

Canadian manufacturers are becoming very uneasy under the so-called reciprocal tariff by which English goods are admitted at a less rate than that imposed on imports from other sources. A special meeting of the Canadian Manufacturers' Association was recently held in Toronto to discuss tariff matters. A resolution was adopted, with but one dissenting vote, in favor of tariff revision upwards in order to decrease the competition of British goods and guard against the danger of having the Canadian market flooded with job lots of goods from the United States. The only member voting against this resolution apparently preferred consistency to solvency, as he is reported to have said

> Unless a change is made in the British preference I shall have to close up my business, nevertheless, I have always been a free trader, and always will be so.

The meeting seemed to be dominated with the fear that pervades Europe, namely, that in times of depression, which they believe to be not far distant, the United States will flood the markets of other countries with an enormous surplus of goods sold at cost or less,

which will annihilate their industries. This fear was voiced by one member as follows:

We are in favor of anything to promote Imperial feeling. But we want the tariff raised, so that when the preference is granted to British goods we will have more protection. With regard to American goods, we are afraid that if bad times come there—and there are indications of it—this country will be made a dumping ground, and will have to share in their depression. American competition is keen enough now, but our industries will be ruined if there is an American depression. We therefore want a revision of the tariff against American goods to prevent such a calamity.

Another member gave a practical illustration, taken from the cotton industry, of the operation of the preferential tariff:

The mills at Halifax are compelled to lie idle three days in the week and put 300 operatives out of work, while British cotton goods are piling up on the wharves in front of them.

The resolutions are to be presented to the Government with an urgent demand that some measures of relief be immediately taken.

A Textile School Proposed in Rhode Island.

A committee appointed at an educational conference called by Gov. Garvin to consider plans for unifying the educational work in Rhode Island, has made a report recommending the establishment of a textile school in connection with the Rhode Island School of Design. The need of a textile school that will be within reach of the large manufacturing population of the state is generally recognized. It is becoming more and more evident that textile schools, like our common public schools must be well distributed throughout the country if they are to benefit that vast number who cannot afford to leave either home or employment to avail themselves of their advantages. The greatest good to the greatest number in textile education is to be attained by locating smaller-sized schools in different sections where the worker can attend at night, or during the day for such periods as he can afford to give up his work. It is for this reason that the proposition to establish a textile school in Rhode Island deserves to succeed.

A French Silk Trust.

The unrestrained competition between the silk manufacturers of France with its attendant evils to both proprietors and workers has led to a movement among the former looking to an organization of producers by which a balance may be maintained between production and consumption. A preliminary meeting has been held at Lyons under the auspices of the Chamber of Commerce. While recognizing the difficulties in the way, the promoters are confident that some agreement can be reached which will be of benefit to the industry in which, at present, profits have been practically wiped out by the unrestrained production of goods and cutting of prices by the numerous individual manufacturers who direct their business operations entirely independent of each other. The weight of opinion favors an agreement among producers, on the lines of the German "cartel," which has worked well in many lines of manufacture. The Deutsche Zanella Convention, which controls the production of a certain grade of linings, is a leading example of the cartel system. It was organized in 1895 to remedy the evils of competition and price-cutting. So far it has been successful in attaining these objects, and this has encouraged the formation of similar associations in other lines of textile manufacturing. One half of the Lyons manufacturers of velvets and plushes are already combined, and the company, or rather association, controls three-quarters of the production of that line of goods. Like nearly every other industrial combination this was organized to protect its members from ruinous competition among themselves. The history of trusts and trade agreements of this character on both sides of the Atlantic show that they are established when business is depressed and when losses take the place of profits, and this rule holds good in respect to the present movement among the Lyons silk manufacturers.

Cyprus Cotton.

In the efforts to find a place outside the United States where cotton can be raised, some one has discovered that the island of Cyprus already produces annually a thousand bales of the staple and that this crop might easily be increased. An Italian writer of the

16th century states that at that time the Cyprus cotton crop amounted to 6,600,000 pounds. A British writer of the 20th century states that the decrease in the last 400 years has been due to impoverishment of the island under Turkish misrule, and to swarms of locusts, scarcity of water and lack of seed since the island became a British possession.

Spinning Yarn in New Bedford.

While Thomas Ashton, secretary of the Oldham (Eng.) Spinners' Association, was in this country last year, he visited the mills of New Bedford and reports have been freely circulated since as to his astonishment at the lack of breakage of yarn in mule spinning in that city. One account was that he stood twenty minutes beside a New Bedford mule waiting for an end to break and finally left without having his desire gratified. Owing to the wide publicity given to this story, on both sides of the Atlantic, Mr. Ashton has recently issued a statement containing a very strong intimation that there are other kinds of yarns spun in America besides cotton yarns, and that this New Bedford yarn referred to is one of the other kind. He admits, however, that he did wait three minutes beside the New Bedford mule without seeing an end break. As no stop watch was used to time his sojourn in the spinning room, the exact time will probably never be accurately determined, and is, indeed, immaterial. The fact is not denied that the work in the New Bedford spinning room was running so well as to astonish the English visitors.

A Threatened Tariff War.

Germany is not likely to find the high tariff road a smooth one to travel. Following the recent increase in the German tariff rates Austria has revised her tariff, raising rates especially on such articles as have been heretofore imported largely from Germany. Russia also has formed a new tariff with the provision that it shall become operative at the discretion of the imperial council. The rates are likewise aimed directly at Germany. An additional complication for the last-named country arises from the depression that is prevailing in nearly all branches of business in Germany. Instead of the European tariff league against this country, which foreign writers have been promising us for a year or more, we are likely to be first entertained with a lively tariff scrimmage among the different countries of Europe itself. The high-tariff policy has worked so well in America as to induce Europe to imitate us, but they are likely to find that what is suited for a comparatively new and almost completely self-supporting country like the United States, may not work the same in Europe.

The Drawback Law.

A recent decision of the Acting Secretary of the Treasury calls attention to the fact that manufacturers are availing themselves of the drawback law on some lines of textiles. This decision was regarding the payment of drawback on a lot of chiffon veilings which had been imported in a plain state, ornamented by the importers, and then exported. The secretary states that the drawback to be allowed is equal to the value of the material less 1 per cent.

Shoddy and Wool in Free Trade England.

In the March issue of the Textile World, appeared an article on Bogus Woolen Cloths in England, written by an Englishman who is familiar with the conditions there. He tells us nothing with which our readers are not already familiar, but, coming from an English source, his statements deserve close attention from that large number of our own people who have been led to believe that the Dingley duty on wool is responsible for an abnormal use of shoddy in American made woolen goods.

The English writer of this article unconsciously supplies proofs of what we have endeavored for the past year to impress upon the advocates of the Grosvenor shoddy bill, namely, that it is impossible to distinguish wool from shoddy when both are mixed together in manufactured goods. The writer tells us what is undoubtedly the fact that vast quantities of shoddy and very little new wool are used in English woolen goods, but when

he tests the English cloths all he does and all he can do is to show how much of the cloth is cotton and how much is either wool or wool shoddy. Neither he nor any one else can tell how much of the cloth is wool and how much is shoddy, simply because shoddy is wool and, in some cases, wool is shoddy. As well might one try to determine by experiment how much of a casting was new iron and how much old iron melted over.

We pointed out over a year ago the absurdity of trying to enforce a law of which, like the Grosvenor bill, a violation could not be detected. The absurdity of the proposition became so plain that the supporters of the bill tried to change it to conform with natural law, and then, failing in that, abandoned it completely. The attempt to regulate the use of shoddy and wool by law has been actively taken up in England just as it is abandoned in this country, and this accounts for the enthusiasm with which our English correspondent discusses the problem. The enterprise will have no better chance in England than it has in the United States. It is absurd because of the following facts:

1. It is impossible to distinguish wool from shoddy when made into cloth.

2. There is not wool enough grown in the world to supply the demand for woolen clothing without using wool waste and shoddy. All the new wool grown each year, if made into cloth, would supply a piece of cloth 35 inches square to each man, woman and child now living in temperate and cold climates. Where is the civilized man, woman or child who would be satisfied with that allotment?

3. Wool now costs as much as the consumer can afford to pay for it. Any such restriction of the use of wool substitute as is aimed at by the shoddy agitation might send the price of wool higher, but the people do not earn money enough to pay the higher price.

When the friends of Grosvenor bills, either here or abroad, have overcome the natural difficulties outlined above, their measure may become something besides the laughing stock of the world.

There is no question but the consumer is frequently deceived when purchasing woolen clothing. That fact is notorious, but the remedy does not lie in the passage of laws impossible to enforce. It is to be found rather in the education of the consumer to distinguish as far as possible good long from short fibres, strong from tender goods, in fact good from poor cloth by the use of such means as are possible, and by the exercise of that ability to discriminate and to judge which is acquired only by a study of cloth and the handling of fabrics.

The Strain on the Warp During Weaving.

A vast amount of time and energy have been wasted in trying to devise a rule for laying out textile fabrics. Elaborate formulas have been proposed, involving the diameter of the yarn, the raw material, twist, weave, etc., but none have found any practical application in mill work. Fabrics are "set" in a certain way, under certain conditions because of what experience has proved to be practicable. This may be called empirical, but science offers no better means, the attempt to supply a substitute having proved merely the knowledge or lack of knowledge on the part of the experimenter regarding algebra, geometry and physics. There is no question, however, but scientific data on this subject would be of great practical value to designers and manufacturers in constructing new and altering old fabrics.

Our attention was recently called to this subject by finding in a German work the results of some experiments in this line by a German designer. They had evidently not been made with great accuracy, but were sufficient to suggest further work in this direction. The table compiled by his designer gave the sets that would cause the same strain on the warp with different weaves and sizes of yarn.

We wish to call the attention of our textile schools to this subject and trust that some of them may be sufficiently interested to make tests that will determine what strain is brought on the warp when using different weaves, sets and sizes of yarn. The principal obstacles to making the tests would be confined to suitable means for measuring the strain, the ingenuity of our designers and mechanics, however, may overcome this difficulty.

Wages in American Cotton Mills.

In the discussion of the threatened strike of the cotton mill operatives the claim was made that wages at Lowell were considerably lower than at other New England cotton mill towns, such as New Bedford, Fall River and Nashua. Comparative wage tables have been published in the daily press, some to support, others to disprove this claim. The question of differences in the wage scales of these manufacturing centres is of local interest, but calls attention to that broader aspect of the subject, the difference between New England and Southern cotton mill wages.

In order to ascertain the facts we have corresponded with many cotton mill men both North and South and obtained from them a statement of the prevailing rates in their mills. A comparison of the Northern and Southern reports discloses some startling differences. The replies are so numerous that a statement of all of them would be confusing. The variation between different centres in the South is as great as between New England localities. To give our readers an idea of the average level in each section North and South, we have compiled from these reports the following table of averages:

WAGES IN AMERICAN MILLS.

	SOUTH		NEW ENGLAND		DIFFERENCE
OCCUPATION	per wk. 66 hrs.	per hr.	per wk. 60 hrs.	per hr.	per ct. per hr.
Mule spinners	$10.12	$.153	$14.48	$.241	57 1-2
Ry. & drawing tenders	3.93	.06	6.53	.109	81 2-3
Roving tenders	5.04	.076	7.77	.129	71
Ring spinners	3.55	.054	6.58	.11	103
Spoolers	4.27	.065	7.10	.118	81 1-2
Warpers	4.51	.068	8.31	.138	102 8-10
Weavers, plain	6.08	.092	8.79	.146	58 6-10
Weavers, fancy	7.76	.117	10.34	.189	61 1-2
Average	$5.65	$.086	$8.73	$.146	70

One of our Southern correspondents gave us a statement on the current pay roll of the mill in which he is employed, and as it happens that these rates come very near to the Southern average, we have adopted them for the comparison. We have every reason to believe the figures to be approximately correct for both sections.

In the difference of wages between North and South is to be found the real reason for the phenomenal growth of the industry in the last named section, and the transference of the manufacture of many lines of goods from the North to the South. These changes can be accounted for in no other way. The difference in the cost of fuel is a comparatively small item. The raw material can be delivered to Northern Mills at as low a cost as to Southern mills; in fact, some of the Southern cotton mill centres are placed at a disadvantage in this respect. Machinery and supplies are certainly no higher in one section than in the other. There remains the difference in the cost of labor, which is a large item in the cost of manufactured goods.

The extent of this difference explains not only the advantage of the Southern mills, but forces the conviction that it is too large to exist permanently on the same side of a tariff wall.

If a general lowering of the American wage level is neither possible nor desirable, there remains the only other alternative in the process of equalization, namely, the raising of the wages in the South. That process is already taking place. The Southern mills have been located where there is surplus of help and in many places the supply shows signs of slackening. In parts of the South the operation of cotton mills is made difficult because of the inadequate supply of operatives. The example which South Carolina has set in regulating the employment of children will be followed by other Southern states and this restriction of supply may have an effect in raising the price of labor.

By far the greater part of the cotton piece goods imported into India comes from Great Britain, the balance from the European continent or the United States.

The people in India are too poor, speaking generally, for the possession of even the one garment of silk which in so many other countries is brought forth to wear on high days and holidays. In Burmah alone is silk commonly employed for apparel. A large proportion of the imported silks and woolens is needed for European use, and for the rest consumption is confined to the well-to-do classes, is not always common even with them, and is therefore strictly limited in comparison with cottons.

The Cotton Supply of the Present and Future.

BY COL ALFRED B. SHEPPERSON.

The subject of the promotion of cotton cultivation in the colonies of Great Britain, Germany and France, has had more attention during the past 12 months than for many years.

In June, 1902, an association was formed in Manchester called the "British Cotton-Growing Association," to stimulate the cultivation of cotton in West Africa and other British dependencies. It was decided to raise a fund of £50,000 (about $250,000) to carry out the objects of the Association, and at a meeting held on 10th instant it was announced that £25,144 had been subscribed to the fund and £4,838 actually paid in.

Within the past year experiments in cotton culture have been made under British auspices in Nigeria, Lagos, Gambia, Sierra Leone and British Guiana, all in West Africa; also in British East Africa and Rhodesia; and in the West India Islands of Jamaica, St. Lucia, Antigua, Montserrat, St. Kitts and Barbados. In January, 1903, as a result of experimental cultivation in Togoland in German West Africa a "German Colonial Association" was formed in Berlin with a capital equivalent to $187,000, for growing cotton on a large scale in Togoland, West Africa, and in German East Africa

In January last a number of prominent French gentlemen formed the "Association Cotonniere Coloniale," with headquarters in Paris, "to develop the production of cotton in the French colonies and especially in the Soudan."

It is recalled that 70 or 80 years ago great efforts were made by the French to promote cotton cultivation in Senegambia, West Africa. Bounties on exports were paid by the government to encourage the industry, but when the bounties were withdrawn the cultivation for export ceased. Another effort was made there during the civil war in the United States (1861 to 1865) and a few tons of cotton were exported but with the close of the war the exports stopped.

The various experiments in Africa and the West Indies during the past year have resulted in the sending to Europe of a number of optimistic reports, a few samples of cotton and a very few bales—25 or 30 probably—of actual cotton.

The governments of Great Britain, Germany and France are giving cordial encouragement and substantial assistance to the efforts to promote cotton culture in their Colonial dependencies. The British government has agreed to pay the salaries of the experts sent out by the British Association to promote the cultivation of cotton in Africa and elsewhere. At a recent meeting of the British Cotton-Growing Association it was officially announced that through the influence of Mr. Chamberlain, the British Colonial Secretary, the West African Railways would transport cotton free of charge for two years and that the steamship owners would carry the first thousand tons of cotton to Europe without any charge for freight.

The expense of transporting cotton from the interior of Africa to the coast will prove a very serious obstacle to the cultivation of cotton as a regular crop. A letter from a gentleman in British Central Africa states the cost of transportation from his locality to Liverpool would be equal to about 2 3/4 cents per pound and this, of course, did not include insurance from the interior to Liverpool. I assume also that the cotton would not be packed in bales of merchantable shape.

The "Textile Mercury" of Manchester says that at a meeting on March 6th of the African Trade Section of the Liverpool Chamber of Commerce, Mr. J. W. Hoffman, the expert in cotton-growing selected by the British Cotton-Growing Association to go to Lagos, on west coast of Africa, to establish the cultivation of cotton there, stated that "As the result of the poor pay given to the negroes in the Southern States, they were being driven from the cotton-producing belt and the acreage had thus been reduced. The consequence was that it would be a question of only a few years before the United States

would be using the whole of their cotton." He added that he was sanguine of success in cultivating cotton in West Africa.

It was not stated whether Mr. Hoffman was a negro or a white man. If he is a white man of the average intelligence of those who have anything to do with cotton in this country there is no excuse whatever for his absolutely incorrect statements on every subject mentioned. If Hoffman is a "gentleman of color," his ignorance explains his inaccurate statements and is a full excuse for them.

Compared with farm laborers elsewhere, the negroes at the South are not underpaid, nor are they being driven on that account from the cotton-growing states. So far from the acreage having been reduced for want of farm laborers it is *now larger than ever before and there is every indication of a large increase this spring.*

The United States mills used last season 38 per cent. of the American cotton crop against 41 per cent. in the season of 1868-69. The average for the past ten seasons of the proportion of the American crop used in United States mills is 33 1/2 per cent.

The gentlemen who have made speeches at the meetings of the cotton-growing associations, and especially the British and French Associations, talked as if they really believed that the United States mills would soon require all the cotton that could be grown in this country and would have none to export to Europe. It is true that our mills have made excellent progress during the last ten years, but their increase in the consumption of cotton has exceeded the Continental mills only by about 300,000 bales.

Our exports of cotton goods are very insignificant, the total value of ALL manufactures of cotton for last season amounting to only $32,108,000 against $307,728,000 by Great Britain. Hampered by the protective tariff policy of our government, the cost of manufacture of our cotton goods is so much enhanced thereby that except for the plainest of undyed cloth we cannot successfully compete with European mills even for the trade of countries as accessible to us as Mexico and the West Indies. China took slightly over one-half of the exports of last season.

The European cotton-growing companies referred to seem to think that the increase in American cotton production is not keeping pace with the increased consumption of the European and American mills. A review of the matter for the past 20 years does not sustain such a contention. In the season of 1901-02, the mills of Great Britain and the Continent consumed of all growths of cotton the equivalent of 8,037,000 bales of 500 pounds net weight, against 5,470,000 bales in 1881-82, showing an increase of 2,567,000 bales of 500 pounds net.

The United States mills consumed in 1901-02 the equivalent of 3,908,000 bales of 500 pounds net against 1,768,000 in 1881-82, showing an increase of 2,140,000 bales. The combined increase in Europe and America was thus 4,707,000 bales, embracing all growths of cotton. The United States cotton crop of 1901-02 was equal to 10,445,000 bales of 500 pounds net against 4,910,000 in 1881-82, showing an increase in production of 5,535,000 bales of 500 pounds net. It is proper to note that the actual *yield* of the crop of 1898-99 exceeded that of 1901-02 by fully 800,000 bales. It is thus apparent that the production of American cotton is keeping pace with the requirements of the European and American spinners.

In the season of 1901-02 the deliveries of cotton to the European mills embraced 77 per cent. of American cotton against 14 per cent of Egyptian, 7 per cent. of East Indian and 2 per cent. of all other kinds.

The high prices caused by our civil war from 1861 to 1865 and the resulting disorganization of the agricultural interests of the South induced such an increase of cotton cultivation in other countries that it was not until 1882 that we furnished as much as 75 per cent. of the total consumption of the mills of Europe and the United States, though in the five years ending with 1860 our proportion of the cotton supply for European and American mills had averaged 84 1/2 per cent. Our proportion of the world's cotton supply has constantly increased since 1882, so that for the 5 years ending with 1900 we furnished to the mills of Europe and this country 83 1/2 per cent. of their entire takings of cotton.

There can be no question that the United States has now regained its absolute supremacy in the field of cotton production and an impartial review of the entire situation respecting the future of cotton cultivation throughout the world fully justifies the belief that we will retain this supremacy indefinitely.

Our principal competitors in cotton production for the European markets are Egypt and India. In consequence of the steadily increasing consumption of cotton by the mills of India, the proportion of the crop of that country which is exported to Europe is constantly diminishing and thus India's proportion of the supply for Europe is continually falling off. During the five years ending in 1865 India furnished an average of 45 per cent. of the cotton delivered to European spinners. For the five years ending in 1875 India's proportion of the deliveries to Europe had fallen to 26 per cent. In the five years ending with 1885 it had declined to 20 per cent. and in the five years ending in 1895 to 13 per cent. In the five years ending with 1900 the proportion had dropped to 7 1/2 per cent.

There is in India an abundance of suitable land which could be added to the area now devoted to cotton, and while some extension of cultivation may be expected, it seems quite evident that the increased production will be fully absorbed by the growing requirements of the Indian cotton mills.

The general uncertainty in regard to the rainfall and its actual insufficiency in many sections of India are serious drawbacks to any considerable increase in cotton cultivation, especially when it is considered that the average yield per acre is only about 75 pounds of lint-cotton of a quality and market value much lower than American cotton. When American cotton is bringing a very low price in Liverpool it is sometimes quite difficult to find purchasers in that market for inferior qualities of Indian cotton.

The chief purpose of the newly constructed irrigation works at Assouan and Assuit on the Nile was undoubtedly to safeguard the crops of the Egyptian land already under cultivation. There will undoubtedly be some extension of acreage, but this will be chiefly in Upper Egypt, where the cotton is much inferior to that grown in lower Egypt, and brings a much lower price. The best opinion is that the increase in acreage in consequence of the new Irrigation Works will be gradual, as it will largely depend upon the construction of canals to take the water to the new fields. There are people who think there will be an addition of 25 per cent. to the cultivable land of Egypt. I am not so sanguine about it though such an increase may be reached some years hence. About 1,800,000 acres are now given to cotton, but wheat, barley, maize, rice, sugar, tobacco, beans, onions and other crops are grown. The system of rotation of crops is general, and the new acreage, like the present, will be devoted each year to the crop which then promises to be the most remunerative. Less than a third of the cultivated land of Egypt (now about 6,000,000 acres) is at present devoted to cotton, and it is unlikely that cotton will get this proportion of the increased acreage. It is thought that a larger share of the new acreage will be given to sugar than to cotton.

Assuming, however, an increase in the Egyptian acreage of 1,500,000 acres and that cotton will get a third of it, or 500,000 acres, this would add about 250,000 bales to the present cotton yield of Egypt. This would probably mark the maximum of the Egyptian cotton crop for some years to come, and, of course, it would not be so large in the seasons when other crops promised a greater profit.

Egyptian cotton commands a much higher price than our Upland cotton, because of its special adaptability to certain purposes and the comparatively small crops which are grown. It is used for fine and high-priced cotton goods, hosiery and underwear and also for mixing with silk in the manufacture of cheap so-called silk goods. As its uses are limited, the price would inevitably decline very materially should the supply be largely increased. No crops of any kind can be grown in Egypt without irrigation, and the cost of production of cotton is very much greater than in this country. The value and the rental of land are both very high and the expense of irrigation for the season is about $10 per acre to many farmers. It is very

evident that a serious decline in Egyptian cotton, due to an over-supply of the article, would cause an immediate curtailment of production.

Brazil, Peru, Turkey and Persia send a little cotton to Europe. It is only about 2 per cent. of the European supply and there is no prospect of an increase in the quantity. Mexico and Japan grow a little cotton, but it is all used in these countries and none is exported. The bulk of Brazilian crop is consumed by Brazil's mills, and any increase of production will be taken by these mills.

In China, cotton is grown in a small way by a great many people who grow other crops as well, but it is rarely, if ever, made an exclusive crop, and no statistics are obtainable of the quantity actually produced. With the exception of a comparatively small quantity exported to Japan, it is all used in China, none having been exported to Europe since 1867. The production of China and Korea is estimated as equal to about 1,300,000 bales of 500 pounds net. The quality of Chinese cotton is undesirable, the staple being coarse and harsh and quite short.

Since 1889 great efforts have been made to promote cotton cultivation in the Asiatic provinces of Russia. The largest crop was that of 1899 which reached 414,000 bales and since then there has been considerable of a reduction. It is likely that the limit of cotton production has been reached in Turkestan until more extensive irrigation works are constructed by the Russian government. The cultivable land in the Asiatic provinces of Russia, if all placed together, would only be about equal to the area of North Carolina and, of necessity, by far the greater part of this territory must be devoted to food crops.

Except for a small increase from Egypt, no greater contribution than at present can be expected to the cotton supply of Europe from elsewhere than the United States.

Cotton can be grown in many parts of the world between 36 1/2 deg. north and 36 1/2 deg. south latitude.

Though about 36 1/2 deg. north latitude is probably as far north as cotton can now be profitably cultivated, it was grown in parts of Maryland, Delaware, New Jersey and Pennsylvania in 1775. Even now it is grown in Turkestan up to about the fortieth degree of north latitude. The climatic conditions most favorable for the full development of the cotton plant and the production of a fibre of good length and strength are warmth and humidity during the season of growth. An insufficiency of moisture, arising from deficiency in rainfall, or too great dryness of the atmosphere, causes a small yield and a short and weak staple. Cotton is often called a "Sun-plant," because, having a tap-root which penetrates the soil from two to five feet, it is better able to withstand the effects of protracted dry weather than many other plants, but a study of the matter makes it evident that a great deal of moisture is essential to the proper development of the plant, and that more failures of cotton crops have resulted from drouth than from too much rain. A generous amount of warm sunshine is requisite for growth and especially necessary for maturity of the fruitage. To get good results there must be ample moisture and ample sunshine at the stages of growth required.

A loamy soil, containing vegetable matter with a good proportion of lime and potash, is the most suitable for cotton. It is quite possible to grow cotton in many countries in which it is not now cultivated, but whether it can be produced in large quantities and at a cost so low that it can be placed in European markets in competition with American cotton is a very different matter.

It will also have to be shown that cotton can be made as remunerative as the other crops which it would replace in the various sections of its proposed cultivation. The people in Africa, the West Indies and other places will not take up the cultivation of cotton unless it can be shown to be more profitable to them than other crops with the culture of which they are familiar. Its cultivation was abandoned many years ago in the West Indies because sugar and tobacco were more reliable and profitable crops.

The underlying motive for the present efforts to promote the cultivation of cotton in Africa and elsewhere is to get the needed supplies of this great staple for European mills at lower prices than have ruled for the last three years.

The average price obtained by the American planters for their cotton during the two seasons of 1897-98 and 1898-99 was, I am satisfied, below the actual cost of production. Those low prices would be very acceptable to European spinners again, but they are not likely to be seen for a long time and if they do occur, it will be from the overproduction of American cotton and not from any of the efforts now being made to establish new sources of cotton production.

Our Southern States have in a greater degree than can be found elsewhere the proper combination of soil, temperature and humidity necessary for the successful cultivation of the cotton plant. These natural advantages cannot be wrested from them nor can they be overcome. There are vast possibilities for the extension of cotton cultivation in the United States, and it can and undoubtedly will keep pace with the increasing demands of the world's spindles.

According to the last United States census there were in 1899 in the farms of the cotton belt (excluding Missouri and Virginia where but little cotton is grown) 303,200,000 acres, of which 92,500,000 acres were improved land. The area in cotton was 24,200,000 acres, being 26 per cent. of the land under actual cultivation and about 8 per cent. of the acreage of the farms.

The Louisiana, Texas, Arkansas, Indian Territory and Oklahoma farms had then 40,000,000 acres of improved land, of which only 10,600,000 acres were devoted to cotton. New land is being constantly brought under cultivation in this territory, and the soil is the most productive in the Southern States. It is probable that these five states and territories have now 45,000,000 acres of improved land and they have the requisite area, soil and climate to enable them to produce as much cotton as is now grown in the entire country. To my mind it is merely a question of time when this will be done.

There will be no "cotton famine" in the near or the remote future unless our country should become involved in war with some European power and our ports should be blockaded. In such an event the European mills would undoubtedly suffer serious loss. The dependence of Europe upon us for cotton and largely for breadstuffs and meat is perhaps the surest bond for peace.

New York, March 30, 1903.

A Model Mill and Village.

THE TALBOT MILLS, NO. BILLERICA, MASS.

Attention has been drawn to these mills during the past month by the inauguration of a plan to pension employees who have worked for the company a certain number of years and become incapacitated for further labor. The mills are situated in North Billerica on the Concord River, four miles from its junction with the Merrimac at Lowell.

The industry was established in 1857 by the Hon. Thomas Talbot, who was governor of Massachusetts in 1879. He was born in Cambridge, New York, September 7, 1818, and was a descendant of John Talbot, the first earl of Shrewsbury, who was killed in the battle of Chatillon in 1458.

Previous to the establishment of the woolen mills, known as the Talbot Mills, Charles P. Talbot and his brother Thomas were engaged under the firm name of C. P. Talbot & Co., in the dyewood and chemical business. Charles P. Talbot was about ten years older than Thomas, and in 1835 was a manufacturer of broadcloths in Williamsburg, Mass. Thomas was employed by him in various capacities until he became a broadcloth finisher. Charles P. Talbot gave up the business in 1837 and removed to Lowell, Mass., subsequently establishing in Billerica the business of grinding dyewoods. Thomas joined him in 1840 and a partnership was formed under the style of C. P. Talbot & Co., which continued with perfect harmony until the death of Charles in 1884. The manufacture of chemicals was added to the business in 1849 and the woolen mill was built in 1857.

"The Talbot Mills were established in 1857 by mutual agreement between C. P. Talbot

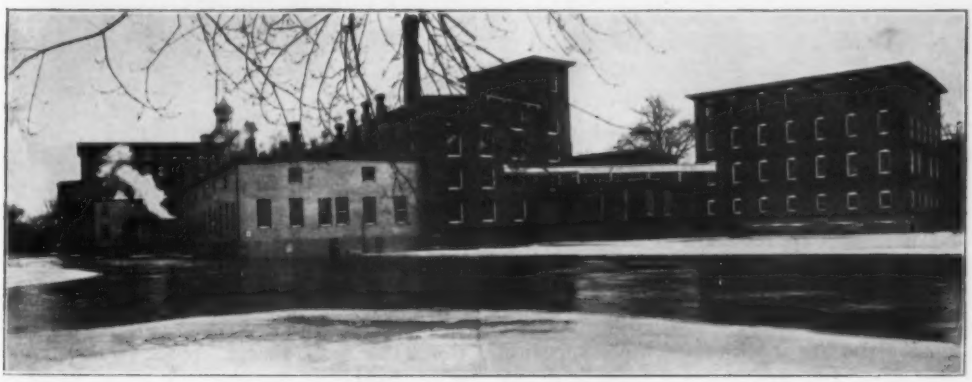
& Co. and the Belvidere Woolen Company, Charles Stott, agent, it being agreed between

Mills goods. The real estate and water power were owned by C. P. Talbot & Co., the

TALBOT MILLS, FRONT VIEW.

them that the contract should be continued for five years from October 1, 1858, to 1862.

machinery was put in by the Belvidere Woolen Manufacturing Company, and to



TALBOT MILLS, REAR VIEW.

The mill should be known as 'Talbot Mills,' and the manufactured product as Talbot

the best of my knowledge and belief, no profits were divided during the five years, it be-

ing understood that at the end of the period agreed upon C. P. Talbot & Co. should have the option to take the whole property at a price fixed upon at the start and the raw material at cost. The original plan was carried out to the letter, and October 1, 1862, C. P. Talbot & Co. were in full possession of all property and good will of the business in which they had hitherto been only silent partners. The transfer was made without any formality, being marked only by a quiet presentation by the two brothers, of a beautiful silver tea set with a testimonial of their good will and appreciation of Mr. Charles Stott, whose connection with the Talbot Mills had ceased. Nothing of special interest marked the change of ownership. There was no elaborate stock-taking or suspension of the work, but a simple withdrawal of the Belvidere Company and a coming in of C. P. Talbot & Co. Business heretofore at the Belvidere office was transferred to C. P. Talbot & Co.'s office on Market Street. The two brothers agreed that C. P. Talbot should look after the interests of the dyewood and chemical works and Thomas should manage the affairs at the mill.

THE LATE GOV. TALBOT, FOUNDER OF THE TALBOT MILLS.

"At this time the removal of the dam at North Billerica was being vigorously pushed by the people of Sudbury, under the impression that they were great sufferers by the overflow of their meadows caused by the dam. The idea was as strenuously resisted before the Legislature by Mr. Talbot, working in season and out for years in defense of his right to maintain the dam as it was. The skill, courage and adroitness displayed in the prosecution of his case before the Legislature during the protracted contest, drew the attention of the members to his indomitable will power, pluck and perseverance, hence he became a marked man, and his district soon discovered in him the qualifications needed to give wise counsel to the governor and elected him to the position. The Sudbury meadow question was scarcely

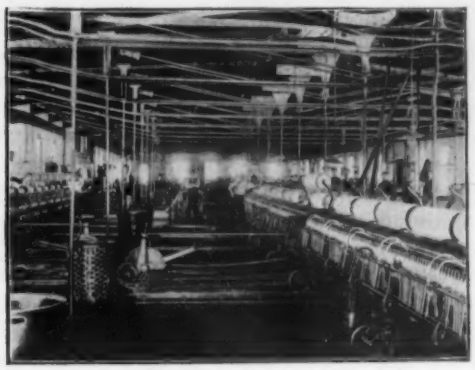
FREDERIC SIMMONS CLARK, TREAS. TALBOT MILLS.

ended when it became apparent that Boston intended to tap the Sudbury River and divert its waters. This was another trial to Mr. Talbot, who fought the question inch by inch

WOOL SORTING ROOM.

as it might involve the giving up of his plant here and locating elsewhere. Notwithstanding all this the business prospered, and in 1870 it was decided to add 112 feet to the 100-foot mill, and put in at once six sets more of machinery. At the same time the spiritual need of the place was made manifest to him and at his own cost of $12,000 he built the Baptist church.

"During the decade from 1870 to 1880 Mr. Talbot reached the height of his political



SPINNING ROOM.

aspirations, having filled with honor to himself and credit to the state the successive positions of councillor, lieutenant-governor, and governor. During this period the mill was a fourteen-set mill, and the product, largely increased, sustained the reputation acquired in previous years. Mr. Talbot, known as a manufacturer and a public man, drew particular attention to the Talbot Mills brand, and I can safely say they had a reputation second to no similar class of goods handled by Parker, Wilder & Co. The results of the business during the above period were such as to justify the putting in of six more sets of machinery in 1880.

"From 1881 to 1884 there was no marked change to note. At the latter date occurred the death of Mr. C. P. Talbot, and the transition from a private concern to a corporation. Its subsequent history is so well known that no comment is needed. It is a sad reflection to the writer that of all the men who were interested at the start, not one remains. Marshall P. Wilder, Rindge & Farnsworth of the firm of Parker, Wilder & Co., and Charles Stott, are names closely identified with its early history. Thomas Talbot, the youngest

WEAVE ROOM.

and last of the firm, before his death in 1885 introduced younger blood, happily combining character, tact and business capacity, which is sure guarantee that the future of the Talbot Mills will be none the less honorable than its past."

Gov. Talbot died October 6, 1885, and the present treasurer, Frederic S. Clark, assumed control. Since that time the mills have been very successful: the management has been conservative and yet exhibited an enterprise which has diversified the product and main-

tained the equipment of the mills at a high degree of efficiency.

At the present time the mills contain twenty-three sets of cards (as compared with eight sets when built), 11,160 spindles and

FINISHING ROOM.

202 looms; the average number of employees is about 400.

In passing through the mill a visitor cannot fail to be impressed with the convenient arrangement of the machinery by which the material is passed from one process to the succeeding one with a minimum of labor. The grease wool drops from the wool sorting room, shown in the illustration, to the lower floor, where it is scoured, dried and blown to bins adjacent to the picker house. The picking department is exceptionally well

A TALBOT "TENEMENT."

equipped, and from it the stock is again blown to bins in the card room. The material is passed easily through the spinning, warping and weaving processes. From the last named the cloth is dropped to the burling and then to the finishing room. The dyehouse attracts especial attention because of the absence of steam. This is due to a unique system of ventilation, which leaves the dyehouse as free from steam as any room in the mill.

Originally flannels only were manufactured in the mills, but with the decline of this business new lines were introduced and at present a widely diversified product is turned out, consisting of both men's and ladies'

THE OVAL.

goods, thibets, cheviots, broadcloths, sackings and fancy suitings. The entire product of the mills has, since their establishment in 1857, been sold by Parker, Wilder & Co., of New York and Boston.

From the very beginning the mills have been noted for the harmony prevailing between the owners and employees, and nowhere can higher praise of the past and present managers of the mills be heard than among the operatives, many of whom have grown gray in the service. Surrounded by charming scenery, this mill village has enjoyed the further advantage of having mill owners who called the place their home. They have always been interested not only in dividends from the mills, but in the material and moral welfare of their employees. In no respect is this interest more evident than in the attractive houses that have recently been built. Our illustration will give the reader an idea of their general character, and one feature to be commended is that no two are alike. Instead of long rows of old-

fashioned, low-studded, box-like mill tenements, standing close to a dusty and dirty road, and in which the windows are conspicuous by their smallness and scarcity, we see in North Billerica picturesque streets and

POST OFFICE AND CLUB HOUSE.

squares, on which front the well-built and attractive houses of the mill workers, surrounded by well-kept lawns, shrubbery and flowers. It is difficult for one who is familiar with the old style of mill town to believe that these are "corporation" tenements. The distinctive character of each gives them every appearance of having been built by individual owners. During the coming season prizes are to be offered to the tenants for the best kept vines, flower and vegetable gardens and window and porch boxes in order to enlist the personal interest of the operatives in beautifying their surroundings.

A system of town water works was established in 1898, largely through the efforts of the mill management, and last year the mill company put in a system of sewerage which is utilized by both the mill and other property owners of the town. The sewage is discharged into purifying tanks where the liquid is separated from the solid material, the latter being used for fertilizing and the former carried to filtering beds. From this filter the water comes perfectly clear.

The post-office is located on the first floor of an attractive building owned by the mill; the second floor is occupied by the Philedian Club, a social organization of the town. An up-to-date school building has just been completed by the town at a cost of $25,000; the building committee, of which Mr. Clark, the mill treasurer, and Mr. Sheldon, the master mechanic, were members, paid for the new building from the original appropriation and had a balance left, which is to be used for shrubbery. A circulating library supported by the mills, is freely used by the people in the village.

The treasurer, Mr. Clark, has carefully studied the various experiments made in this country and abroad for bringing employer and employee into more harmonious relations. Among these is the pensioning of old employees, and on March 6, 1903, he made

SCHOOL HOUSE.

the following announcement of a plan which applies to past as well as to future employment in the mills:

North Billerica, Mass., March 6, 1903.

I take pleasure in announcing to our employees that the directors have adopted a pension system under the following

RULES AND REGULATIONS.

1. Until further notice all persons who have been employees of the Talbot Mills and of the woolen mills of Messrs. C. P. Talbot & Co., who are now in the employ of the Talbot Mills, and all who may hereafter be in such employ, except officers of the corporation, shall be entitled to participate in the system of pensions upon the following terms and conditions:

2. No pensions shall be given for less than fifteen years' continuous service.

3. The amount of annual pension shall be a percentage of the average wages earned per year for the ten years next preceding retirement. Said percentage shall be determined by the number of years of continuous service, and for fifteen to thirty-five years shall be one per cent. per year for every year of service. For periods longer than thirty-five years the percentage shall be fifty per cent.

4. No pension shall exceed five hundred dollars.

5. When, in the opinion of the management, an employee, through old age, or other cause for which he, or she, is not responsible, has become incapacitated for labor, such employee may be retired on pension. When incapacity results from any cause for which the company shall pay compensation, the amount thus paid shall be deducted from any payment provided by the pension system.

6 Employees who have reached the age of seventy years may also be allowed to retire on pension at their own pleasure.

7. If, after the retirement of any employee on pension, he, or she, shall engage in any employment for compensation, except with the approval of the management, his or her pension shall cease.

8. When incapacity to work is the result of intemperance, or of any cause within the control of the employee, no pension shall be given.

Frederic S. Clark, Treasurer.

The pensioning of employees is not a new idea. In Germany it is required by law, the expense being borne by both employer and employee. Attempts along this line have been made at various times in this country, but with indifferent success, owing to causes reflecting in no way on the merits of the plan itself. The principle usually receives practical recognition where employer and employee have been associated as such for a considerable time. In nearly every mill which has been run for years by the same family there are to be found old employees kept on the pay roll for what they have done rather than for what they are doing.

The practical operation of the plan adopted by the Talbot Mills will be watched with much interest and it is to be hoped that it will mark a step toward the solution of the many pressing problems arising from the relations of capital and labor at the present time.

Spinning Woolen Yarn on Ring Frames.

Only one hundred and thirty-six years ago all spinning of textile fibres was done by hand, chiefly by women and girls. We say

HAND SPINNER AT WORK.

"only" because one hundred and thirty-six years is a brief period in social and industrial evolution. Even at the present time we find hand spinning still in vogue. In the mountain districts of Tennessee it is used extensively for making yarn for both weaving and knitting.

In hand spinning the strand of soft roving, attached to the spindle at one end, is held in the hand of the spinner and drawn out or stretched as the spindle revolves slowly. When extended as far as desired, the spindle and bobbin are revolved rapidly to put twist in the yarn. When this process is completed the twisted length is wound on the spindle and the operation of drawing and twisting repeated with a new length of soft roving.

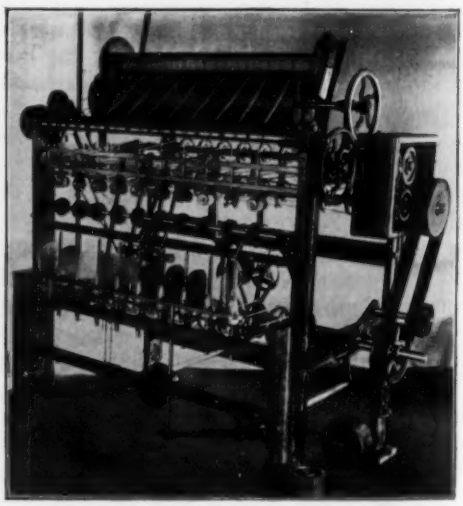
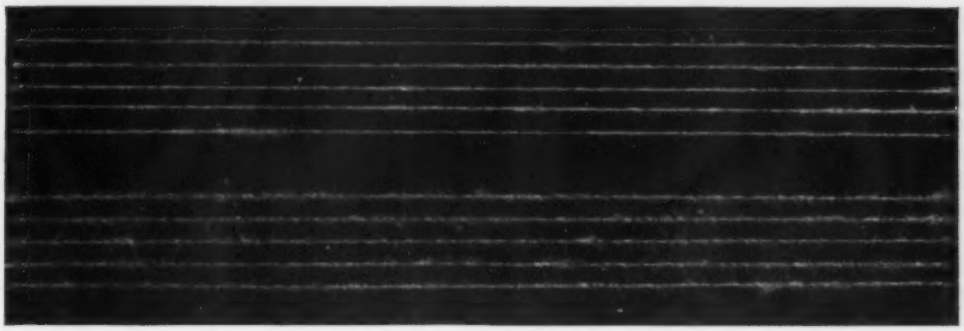


FIG. I. THE BREEZE RING FRAME FOR WOOLEN YARN.

In 1767 Hargreaves invented the spinning jenny by which yarn was spun on the principle of the hand wheel. It is said that before the appearance of Hargreaves' machine six

spinners working with hand wheels were required to keep one hand weaver going. The Hargreaves jenny enabled a spinner to do vastly more work, and it was quickly followed by the invention of Arkwright, which brought into use a new principle of spinning, differing radically from that of the hand wheel and Hargreaves jenny.



YARN SPUN ON THE BREEZE FRAME.

Arkwright employed two pairs of rollers as in the modern ring spinning frame, the front rollers running at a greater rate of speed than the back rollers. The roving was passed successively between these rollers and stretched out by the unequal surface speed. These two methods of spinning, that of the hand wheel and that of the Arkwright water frame are still used in spinning machinery of the present day. Both of them are embodied in the modern cotton mule, which first draws the cotton roving finer by means of two sets of rollers and then draws the yarn still finer by means of a traveling carriage which dupli-

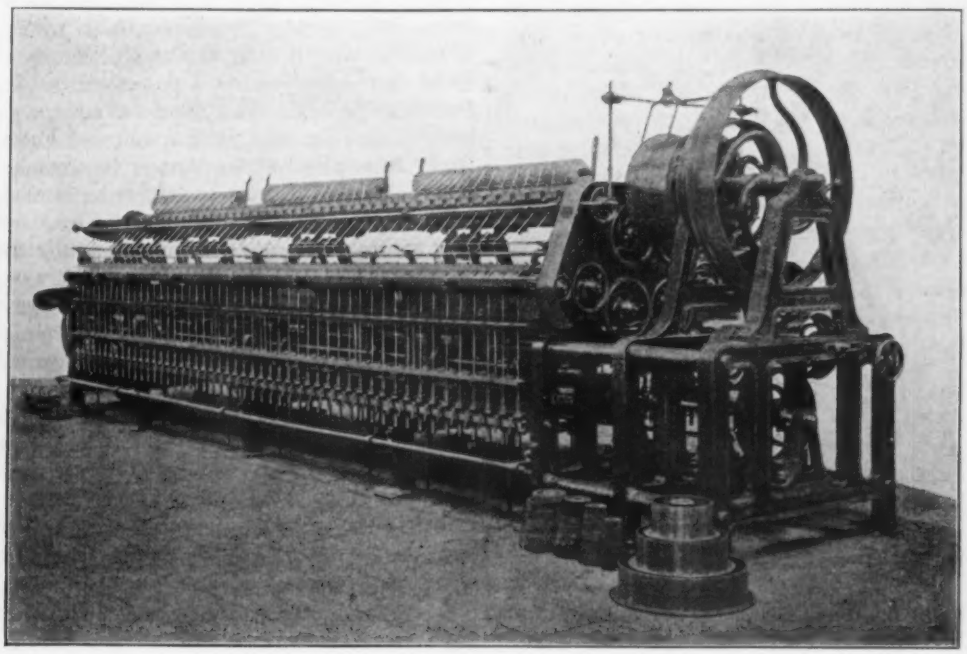


FIG. 2. BELGIAN RING FRAME FOR WOOLEN YARN.

cates the movement of the spinster's hand in the old hand wheel. The Arkwright principle alone is used for the modern ring frame and the hand wheel or Hargreaves principle is the only one employed for the woolen mule or jack.

The Arkwright roller system has not been adapted for spinning short fibres, especially when they are formed into a strand in a tangled mass, as by the woolen card. While all textile fibres can be spun by the hand wheel method the roller principle has found its limitations which inventors thus far have been unable to remove in spite of constant efforts ever since the appearance of the Arkwright frame, and today all carded woolen roving is spun on the spinning mule or jenny by the hand wheel principle.

Something more than half a century ago an inventor at Pittsfield, Mass., made extensive experiments and constructed at great expense a ring frame for carded woolen yarn. The machine, however, found its way to the

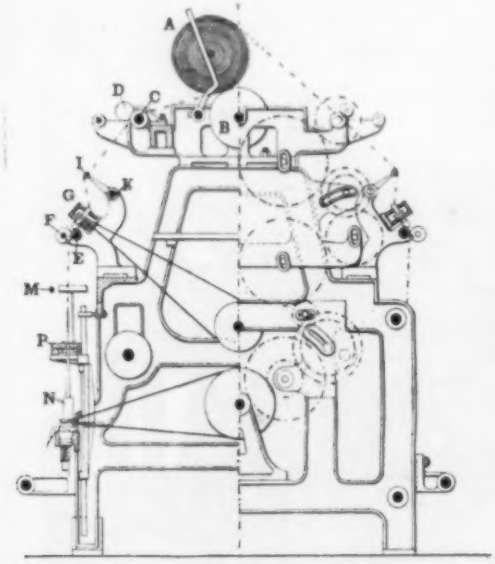
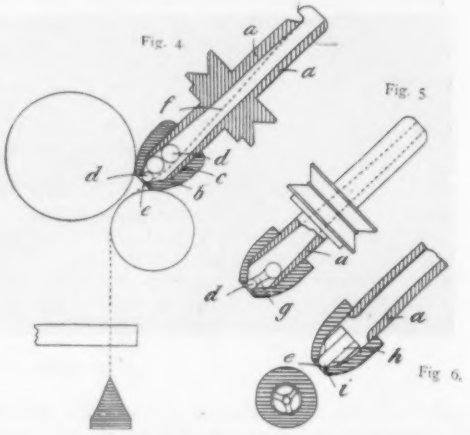


FIG. 3.

junk heap after bringing the inventor to poverty. About twenty years ago one of our leading machine shops made an attempt to solve the problem and constructed a machine which was built in the most thorough manner, but it was eventually abandoned as impracticable.

Recently other inventors have tackled the question and one of them, F. A. Breeze, Forest Mills, Canada, claims to have built a spindle spinning frame that successfully spins



carded woolen roving. He is confident that the machine will eventually revolutionize woolen spinning. A view of the sample frame built by Mr. Breeze is shown at Fig. 1, and, as will be seen, has the advantage of small floor space which is possessed by ring frames in general. This machine has not yet been placed on the market, but we understand from the builder that it has reached such a stage of development that he is ready to demonstrate to interested parties the success of the process. In this machine the soft roving passes over rollers ingeniously arranged to introduce twist roving while drawing it out finer, thus duplicating as far as possible in a continuous machine the principle of the hand wheel.

The inventor states that the range for drafting is equal to the self actor, and gives the following sizes of roving and yarn spun on the frame:

Colored wool, 1 1/4 Run roving to 2 Run yarn; white wool, 3 Run roving to 5 Run yarn; brown cotton, 3 Run roving to 3 7/8 Run yarn; natural grey wool, 1 1/8 Run roving to 1 3/4 Run yarn.

While inventors in this country have been busy trying to solve the problem of ring spinning of carded woolen, those in Europe have not been idle. The latest attempt in Europe has been made by the Societe Anonyme Celes-

tin Martin, of Verviers, Belgium. The machine built by this company is shown at Fig. 2, this illustration being taken from Uhland's Technische Rundschau. A sectional view appears at Fig. 3. The spool of roving (A) from the card rests on the drum (V); the continuous movement of the latter feeds the roving to the rollers, one half of the ends passing to the right and the other half to the left. They pass first between the rollers (D and C), which are pressed together by suitable weights. The thread is then carried over the guide bar (I), through a torsion tube at (G), from which it passes between the two rollers (F E). Three different forms of these torsion tubes are shown at Figs. 4, 5 and 6.

As shown in Figure 4, the torsion tube, a, of cast metal and forming one with the driving-pulley, is pierced with a hole of double conicity, b and c, and contains several balls, d, the lowermost of which perfectly closes the outlet-orifice, e. The thread, f, is slightly pressed by this lower ball against the wall of the orifice, a, and is thus caused to rotate with the tube, a, and to become twisted. Owing to the upper conical portion, c, with which the upper balls rotate, these latter press upon the lower ball, which the rotation tends to displace and to raise. There follows from this a moderate pressure of the whole upon the nose, e, and a moderate wedging of the thread at this point.

The upper balls, serving to exert pressure upon the lower ball, need not necessarily be independent of the latter. Fig. 5 shows a constructional form in which the part, d, closing the outlet of the tube, a, is rigidly connected by means of a rod, g, with an upper ball, producing the required pressure.

In Fig. 6 the part used for closing the opening and that for producing the pressure are replaced by a single part, h, terminating in an extremity, i, adapted to obturate the outlet of the tube.

The draft of the roving is obtained by the difference between the speed of the rollers (F E) and the yarn as it is delivered by the rollers (D C). The torsion tube, which is driven by a band, puts a false twist in the yarn during the drafting process. This false twist strengthens the thread and prevents its breaking. It also contributes to the uniformity of the finished thread; the twist runs first into the fine places, leaving the coarser places in the yarn soft and permitting them to be drawn down finer, thus removing the inequalities in the thread. The guide bar (I) is made adjustable so that the angle at which the roving enters the torsion tube may be varied; it is claimed that this enables the stock to be subjected to more or less friction in the tube, making it smooth or fuzzy as desired. After leaving the rollers (F E), the yarn passes to the bobbin ring spindle (N) where it is twisted and wound as on the ordinary ring spinning frame.

The builders claim that with this Belgian machine a uniform false twist and, consequently, an even thread is obtained. Much interest will undoubtedly be felt in the development of this process, which if successful will mark a very important improvement in spinning woolen yarn.

Fine Spinning.

BY HENRY G. KITTREDGE.

The spinning of any fibre depends on its physical characteristics and the manner with which it is manipulated. There has never been invented a mechanical device that has automatically equaled in perfection of work the capability of the human hand, and has exceeded the latter only when it has not been trained to its fullest capacity. It is for this reason that the textile arts of ages ago, when manual labor alone was depended on, remain unexcelled in the present age of machinery. Spinning is no exception to the rule, and specimens of the fine attenuation to which fibres can be spun by hand are to be seen in museums among articles of ancient craft.

There has never been spun by machinery a cotton thread of such exquisite fineness as that to be seen in the Dacca muslin of India, and which can be woven single. The cotton thread of Dacca muslin is a wonderful product of what the human hand can do. It is made from a selected cotton of native

growth, but, at the best, with a length of staple inferior to the poorest raised in the United States, and of coarser fibre. A thread of equal fineness spun by machinery would have to be made from cotton with more than two and a half times the length of staple, and even then it would be absolutely unfit for power weaving, unless it was double and twisted, which would require an amount and delicacy of handling that would be impracticable except at an extreme cost.

There are several qualities of these Indian muslins, the best is that known as "King's muslin" (Mulmul Khas), valued at about $5.00 a yard, and the value of the yarn may be reckoned at about $150.00 a pound. A specimen of this quality was exhibited at the Philadelphia Exposition of 1876, in the British section, and is probably the only instance of such an exhibit in this country. One yard of it weighed less than five drams, and contained 2,880 ends in the warp and the same number in the filling, making the yarn at an estimated fineness of No. 350 to 400. It has been calculated that some of these muslins have yarn as fine as No. 500, and an example of this is reported as having been on exhibition at the London Exposition of 1862. The yarn in the muslin specimen at Philadelphia had about six or eight filaments in its cross section, which may incidentally confirm the calculation of the yarn being about number 450.

Dr. F. H. Bowman has estimated that there are 140,000,000 fibres of cotton in one pound. Taking the average length of the cotton fibre at seven-eighths (7/8) of an inch, we have 3,400,000 yards of fibres were they arranged in one line, end to end ($140,000,000 \times 7/8 \div 36 = 3,400,000$). This would give the fineness of a cotton fibre as No. 4,000, or a trifle over ($3,400,000 \div 840 = 4,000$).

If a thread contained eight of these fibres in its diameter, it would indicate that it was about No. 500.

The fact that an Indian muslin thread can be spun so fine and woven single, is undoubtedly due to the large amount of twist put in it, and to the peculiar compression that is given to it by the fingers of the spinner, and this compression also has the effect of diminishing its diameter so as to make it appear finer than a thread of equal weight spun on a mule.

At the International Exhibition of 1862, a few yards of muslin were shown, said to have been made from No. 700 mule spun yarn. It was a costly experiment to see what could be done by machinery, and to fix a limit of fineness at which cotton yarn could

NO. 320. NO. 200.

MULE SPUN SEA ISLAND COTTON.

be woven at all. The yarn showed an improvement over anything exhibited at the 1851 Exposition, due to the introduction of combing cotton by Heilman's invention. Compared with Indian muslin, the fabric was imperfect and inferior in all points of fabrication, though the cotton used was the best Sea Island that could be procured. There is one thing of no little moment that gives to Indian muslins their great comparative durability, and this is the large amount of twist that is given to the yarn, and which the fingers seem able of imparting more effectually than can be done with machinery. The Dacca muslin thread has, oftentimes, as much as 100 to 110 twists in an inch, while the machine twist may not exceed 80.

Flax fibre is capable of being spun into a thread nearly as fine, if not as fine, as that of cotton. While a yard of Dacca muslin can

be made to float in the air at one whiff of the breath, the same can be done with the finest flax fabric. While the commercial cotton fibre is indivisible, and, therefore, is the ultimate thing, the same is not the case with the commercial flax fibre, which, rather, is a bundle of five to ten filaments cemented together, though easily separable into their ultimate parts of one to one and a half inches long. It is the bundle flax fibre that is referred to in manufacture. A flax thread spun to the fineness of 500 leas, equivalent to about No. 180 cotton, is about as far as machine spinning can practically go, and little progress in this quality of spinning has been made within the last fifty years, more than improvements in mechanical facilities of doing the work. Though there is imported into the United States a considerable quantity of flax thread, much the larger portion of it is coarser than 50 leas, yet occasionally a limited quantity as fine as 400 leas comes in, valued, it may be, at $15.00 a pound in the foreign market.

Flax, however, like cotton or any other fibre, can be spun into a finer thread by hand than by machinery. The latter is too positive and unyielding, and incapable of correcting any weakness in the slubbing that may at any time occur. Irish flax has been hand spun for cambrics as fine as 600 leas for warp and 1,000 leas for filling. Examples of such dexterity of spinning and weaving have been seen at exhibitions, and are to be met with in museums, and occasionally appear in trade. Cambrics made from such yarn are like gossamer, and resemble a spider's web. A specimen of such a fabric was exhibited at an Irish fair, fifty years ago, with 10,000 threads to the yard, and so delicate was the process of weaving that it took the weaver a month and a half to do a yard, but when finished it was the poetic ideal of Arachne's web that excited the envy of Athena.

In a report of the Belfast Exhibition, 1851, a specimen of linen is spoken of, the yarn for which was spun on a hand wheel by an Antrim county woman, to the fineness of 1,120 leas, equivalent to No. 400 cotton. This is the finest flax spinning of which I have any record.

There is no authentic record of any great spinning feat with ramie. This fibre, however, is unequaled by any other in the vegetable world, with the single exception of cotton, and the only reason it is not more largely employed in manufacture is because of the relatively high cost of preparing it for this purpose. Its physical structure would lead one to believe that it is capable of being spun much finer than possibly can be done with flax. Instead of having five to ten filaments, as is the case with the latter, it has seldom more than three and frequently no more than one, and this ultimate filament or fibre is never less in length than the best flax ultimate fibre and sometimes five times longer. There is every reason to believe that with proper preparation the ramie fibre can be spun as fine, if not finer, than cotton.

Wool has never been spun, so far as known, to the extreme fineness of either cotton or flax, of which we have record. So far as the woolen, in contradistinction to the worsted thread is concerned, it is a doubtful question whether there has been any improvement in its construction within the last half century. Charles Vickerman declares that the woolen therad was never so badly or so imperfectly formed as it is now, and he attributes it largely to the present system of deficient number of drawings or levelings of the sliver and slubbing. The tendency to this shortcoming in the construction of the woolen thread was first inaugurated in mechanical spinning with the invention and use of John Goulding's system, when the billy or slubbing frame was discarded. There is not enough leveling for fine spinning. To partially make up for this deficiency in time of need, second or third drawings are made on the jack or mule. At the Philadelphia Exposition of 1876, there were exhibited all-wool white flannels made by the Ballardvale Mills, Ballardvale, Mass., with 20-run warp and 28-run warp. This is believed to be the finest woolen yarn ever spun in the United States. The strength of the warp may be somewhat understood when it is stated that it carried from 130 to 140 picks of weft to the inch.

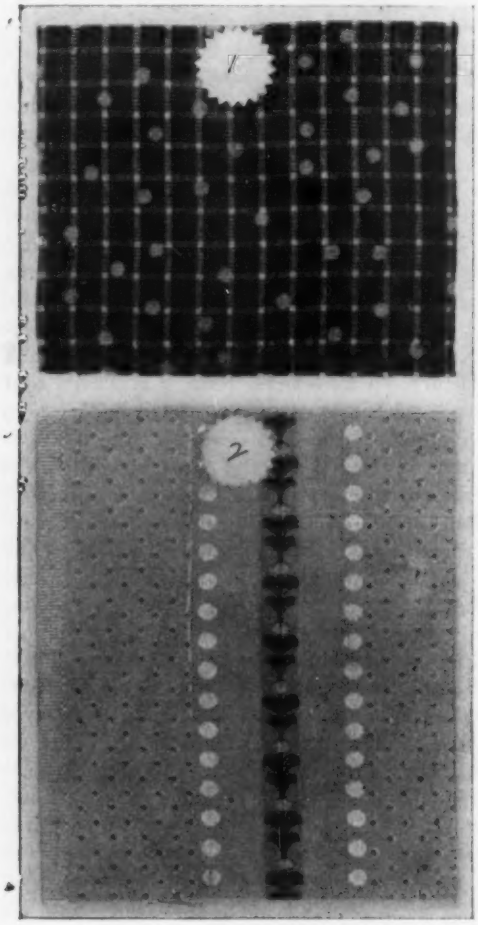
In the manufacture of worsted yarn, probably nothing has exceeded the fineness of some of the French product, as well as its

softness, evenness and fulness of thread for the number. Perfect weft yarn has been spun by the French, according to their system, as fine as No. 178 or 200, metric. This fineness, of course, can be accomplished only by the use of the finest and highest bred merino wool, of good length and evenness of staple, a thing that is becoming scarcer and scarcer.

Seasonable Fabrics.

MEN'S WEAR WOOLENS.

Business in this division of the market still continues to lag and not much improvement



has been noticed since our last writing. Not even the most enthusiastic selling agent will go the length of saying that prevailing conditions are satisfactory although hopes are entertained for some improvement in the near future.

The existing conditions may be attributed to several causes. In the first place clothiers were evidently backward about coming into the market on account of the prevailing high prices and are now pursuing a waiting policy in the hope of being able to place their orders to better advantage later on in the season. Up to the present time, no weakening of prices in any direction has been evidenced and while the conditions of the yarn market remain as they are, it is hard to see how manufacturers can name any better prices without a direct loss. Although the business on lines of men's wear fancy worsteds is so unsatisfactory, worsted dress goods are very strong, thus maintaining a demand for worsted yarns and preventing any weakening of prices in the raw materials market.

Another reason which has been given for the depression in this division of the market has been that of over production. At the time of the American Woolen Co.'s strike, it is well known that many manufacturers of dress goods turned their attention to the making of men's wear goods if not entirely at least in part, and as an illustration it may be mentioned that a certain manufacturer in the Philadelphia district, who prior to the strike, was running 350 looms on dress goods and 150 looms on men's wear fabrics, has since then been running about 350 looms on men's wear fancy worsteds, and only 150 looms on dress goods. This is only one of many similar cases, and it is claimed that the result has been a production greater than the demand particularly in the line of fancy worsteds.

On woolen goods the situation is much better than on worsteds. These lines in the majority of cases are on a very little higher basis than last season's prices and where style and colorings have been correct, little

difficulty has been experienced by the agent in placing the production to good advantage. The popular prices have, as usual been from eighty-five cents and ninety cents to a dollar twenty-five and it is here that the keenest competition has been felt. Deliveries up to the present time have been very good, but as the majority of sample piece orders do not call for delivery before the latter part of April it is difficult to tell at this time what shape manufacturers are in to make prompt deliveries, but from the fact that buying was pursued upon such conservative lines it is expected that there will be much difficulty on this score.

Cancellations are being received to a certain extent, but it is not anticipated that they will be any greater than usual; in fact there is reason to believe that they will be fewer in number than last season. Preparations are already under way for new lines of light weights, but it is not anticipated that they will take any definite shape for several weeks to come, although there is a strong likelihood that the opening of light weight lines may be somewhat earlier than was the case last year when lines were not fully opened up until the middle of August.

The situation on overcoatings is fairly satisfactory more particularly on the lower priced goods, kerseys are particularly strong and it is feared that manufacturers may encounter grave difficulties in filling their contracts owing to the difficulty of procuring a satisfactory grade of merino rag. The shortage of this commodity may be attributed to the fact that for several seasons past fashion has demanded that ladies should wear heavy weight fabrics, broadcloths, etc., to the exclusion of the lighter weight dress stuffs, such as cashmeres, henriettas, etc., and it is from cast-off clothing made from goods of this latter character that the best grades of merino rag are produced. The only really good substitute is fine merino wool but this, of course is too expensive a stock from which to manufacture the lower grade kersey cloths. The merino rag that is being used today would have been rejected six months ago by almost any manufacturer. It is reported that a prominent mill manufacturing kersey cloths has had fully fifty per cent. of returned goods from the sample pieces delivered, buyers claiming that the goods were greatly inferior to sample.

One prominent selling agent stated this week, that a line of kerseys made by one of his mills and which sold last season at $1.30 had been advanced this season to $1.45 and even at the advanced price the fabric had been considerably deteriorated. Some of the more advanced and progressive agents are of the opinion that fancy overcoatings may develop considerable strength later in the season, their argument being that the strapped ulster is likely to become a popular garment for the coming winter season.

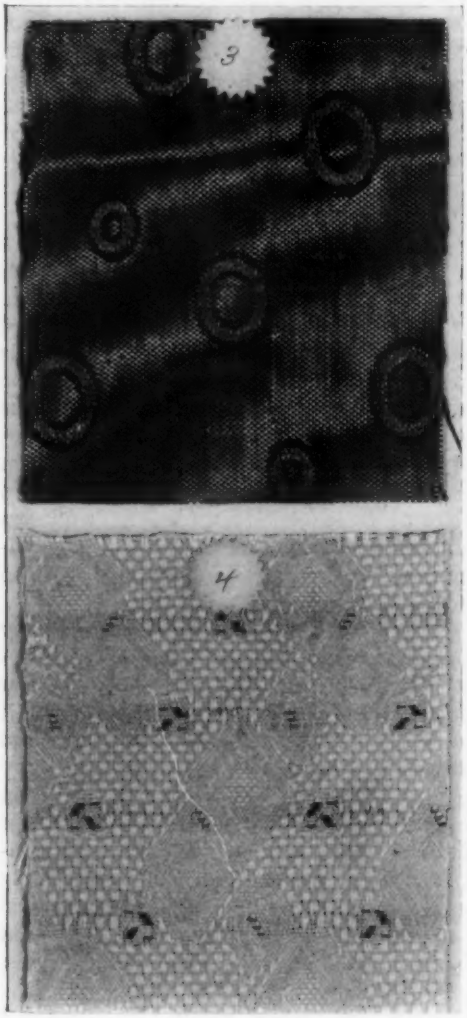
DRESS GOODS.

Conditions which prevail in the men's wear division of the market are exactly reversed in the dress goods section, for, while in the former case woolens are better situated than worsted lines, in dress goods, worsteds are in the lead and their popularity cannot be questioned. Thin, sheer, light weight fabrics such as voiles, etamines, veilings, etc., cannot be made of woolen yarns and they must necessarily be constructed of worsted stock. Prices on lines for fall are from ten to fifteen per cent. in advance of last season's quotations and are being well maintained with no evidence of weakening.

Zibelines will undoubtedly hold a strong place and considerable attention is being devoted to them not only in plain cloths, but also in fancy effects. In this connection it has been noted that the more closely sheared cloths are preferred to the long shaggy hairy surfaces. Zibelines are also being shown in heavier weights adapted for misses' and children's cloaks and on these lines competition has been exceedingly keen and a lively war of prices has been raged between several of the manufacturers. The keen competition has been on lines of cotton carded goods, ranging from 80 cents to $1.20 per yard.

Boucle and noppe effects in variegated colors are considered good and are being shown quite extensively in some of the leading collections. Plaids were considerably talked of earlier in the season, but the general opinion seems to be that they should be touched but lightly. For immediate delivery

voiles, veilings, eoliennes and similar loosely meshed fabrics continue in strong request. A silk and wool eolienne that has had an excellent sale is constructed with a heavy silk warp thread with fine wool thread the other way, producing a beautiful combination of strength and softness, firm in texture, and having a fine silky sheen.



Mohairs and sicillians continue in great request and the supply is at no time equal to the demand. Cream mohairs have been at a premium for some little time and every shipment that comes into the market is quickly distributed. Bradford manufacturers are rushed to their utmost capacity and advances approximating fifteen per cent. have been made on some lines. Fancy mohairs, more particularly in black and white effects in stripes, checks, etc., have been much in demand. Mohairs will undoubtedly continue to be a strong feature of the dress goods market for fall lines. Metallic printed mohairs have been ready sellers, but considerable difficulty has been experienced with some lines owing to the fabric having been weakened by the printing process and this fact has tended to cast discredit on all lines of printed mohairs with the result that the demand is not as great as it was earlier in the season.

SILKS AND VELVETS.

Unusually active conditions prevail throughout the silk piece goods market and manufacturers and selling agents are in a generally satisfied condition. Taffetas are in great demand particularly in blacks, whites and navies with stocks in the market at low water mark. Advances of from five to ten per cent. have been made on lines for fall and a satisfactory amount of business has already been booked in several directions. Crepes de chine have been one of the particularly strong features of the market and there is no question but that the popularity of this weave will continue for some time to come. Foulards in small neat effects are finding a ready sale but they are being handled on a very conservative basis and there is no possibility that the experience of last season will be repeated this summer. At Fig. 1 is shown a very successful fabric which was referred to in last month's issue. This is the "Taffeta Rondgeant" made by Valentine & Bently and on which they have had an exceedingly satisfactory business at ninety-five cents. This is a light weight lustrous fabric of a taffeta construction. The ground work is in a variety of patterns of neat checks and plaids in harmonizing colors with an over design of various sized dots in white. The effects in the large variety of patterns which they have produced are uniformly quiet and refined and the cloth may already be counted one of the season's pronounced successes. At Fig. 2 is shown one of the styles of another successful fabric shown by Spielman & Co. (Gargan's

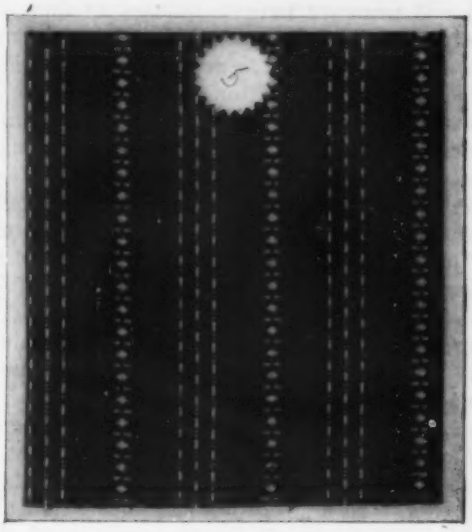
Department) and is the production of another of our domestic manufacturers. This fabric which is known as a "mock swivel" is of a taffeta construction with white ground and self dots and stripes and heavy woven stripes in Persian and floral effects in black as well as a variety of colors and combinations of colors. This has been an excellent seller at seventy-five cents, regular, in twenty-one inch width.

Silk and linen fabrics have attracted considerable attention and their wearing qualities have gained for them a wide popularity. At Fig. 3 is shown one of the styles of a cloth of this character from the foreign line of Spielman & Co. in the department referred to above. The construction is on the Louisiene order with solid color ground work of jasper with woven jacquard pattern of various sizes of concentric rings in alternate black and white. At sixty-seven and one-half cents regular this cloth has met with a ready sale. Black and white checks and shepherd plaids have been one of the strongest features of the season and their popularity still continues. Goods of this character are being largely used for shirt waist suits as well as for separate waists.

There is every indication that velvets and all pile fabrics will occupy a strong position in the fall trade and extensive preparations are now being made along this line. While the greater amount of business will be done on plain velvets there is every indication that fancy effects will be used to quite a considerable extent. The peon or mousseline effect will be one of the popular leaders and fair sized orders have already been booked for the fall season. William Openhym & Sons than worsted lines, in dress goods, worsteds one of the leading velvet houses are showing a very extensive line of novelties in the way of printed and extracted velvets in tweed or cloth effects designed for entire costumes. These have been very favorably received by the trade and their success on this line is already assured.

PRINTS, GINGHAMS AND COTTON DRESS GOODS.

The cotton goods market still continues exceedingly firm with stocks low and desirable goods difficult to procure. Print cloths still rule firm at three and one-fourth cents and nothing in sight to indicate lower prices, in fact, there are those who prophesy still lower prices before the season is over. The demand for white goods still continues strong with available supplies fast disappearing from the market. Heavy weight goods such as vestings and basket weaves are in the lead, with a tendency toward the larger and more pronounced patterns in checks etc. as well as scroll and floral leaf designs. At Fig. 4 is shown one of the popular selling patterns in goods of this character from the line of S. Guggenheimer. This fabric in twenty-seven inch width has been a good seller to the retail trade at sixty-seven and one-half. Another good style is a heavy mercerized cloth



which has been one of the best sellers in the line of Francis R. Masters at forty cents in twenty-seven inch width. At Fig. 5 is shown one of the new styles in black and white effects of the White Star Superfine percales made by the Arnold Print Works and sold at eight and one-half cents in thirty-six inch width. Considerable advance business for delivery up to March, 1904, has already been booked on white goods lines, but buyers have confined themselves largely to staples in medium and heavy weight goods. Ginghams still continue strong and a generally sold-up condition exists throughout the entire market.

TEXTILE PROCESSES.

EDITED BY E. A. POSSELT.

DESIGNING, WEAVING AND MANUFACTURING JACQUARD FABRICS.

There are any quantity of designers today engaged in the manufacture of what we term Harness or Dobby work, who, if compelled to go on Jacquard work, would be completely at a loss as to how to proceed; and yet at the same time Jacquard work is actually nothing more than harness work extended. The same designer would think nothing of it if compelled, for example, to change from a mill using 12 harness dobbies as limit of capacity of their looms, to a mill where looms are employed using 24 or 36 harness dobbies, in fact he might welcome the change since it would give him a chance to expend his abilities in designing. However, the same man would in despair, refuse a call for the position as designer for a mill using Jacquard looms and this possibly for the fact that the word "Jacquard" bewildered him, never considering that at the same moment he is possibly doing work requiring more brain and practical experience with reference to designing and cloth construction, than said Jacquard work he may have refused to undertake. To overcome such a disadvantage to designers for harness work, as well as to educate students in general, in designing and manufacturing of all kinds of fabrics executed on the Jacquard loom will be the purpose of the present series of articles.

SKETCHING.

The most important knowledge for a Jacquard designer is to be able to draw with ease and freedom. There is no use for a student to undertake the practical working out of a design on point paper until he has acquired a reasonable amount of skill in drawing; it gives freedom and precision to the hand, trains the eye to judge more accurately the proper proportion and position of the parts of a design, besides develops to the student a feeling for beauty of line and form to the figure of his design.

THE BEST PLAN TO MASTER DRAWING IS

to copy good examples, either from drawings or fabrics. A good plan, where the student is limited to subjects of this kind, is, for example, to draw, i.e., copy in outlines good wall paper designs. In either case first start to assist the eye, with squaring off the example and transfer, i.e., draw it (copy it) free hand, having previously prepared (squared off) your drawing paper conformingly with squares on examples. By and by use a less and less amount of squaring off until you are able to copy a design gracefully without the necessity of squaring it off. Enlarging given designs in this manner will also prove of vast benefit to the student.

The next thing to do will be to draw from nature, first simple leaves, flowers, etc., until gradually mastering the most complicated. This will not only continue to give the student practice in drawing but at the same time will prepare him for making original designs since the most common found leaves, flowers or plants are the foundation of the best designs for textile fabrics. Geometrical designing certainly must also be fostered by the student, since geometrical figures form the basis of some of the most excellent designs for textiles; however, they will come much easier to the student compared to good floral designs.

After having mastered drawing, the next work for him in the production of original designs is to master the setting of the figure or figures and the most practical size to draw them. The various principles of designing for textiles as the "drop pattern," the "turn over pattern," the "plain setting," the "four harness broken twill setting," the "regular satin order setting," the "setting by irregular satins," etc., all must be carefully studied. With some fabrics he will have to study to prepare the proper borders, or borders and corners, to his centre design, or vice versa. These various methods of setting figures for a design will form the subject for a future article.

After having produced the proper sketch of design as to appear in woven fabric, we come to

DESIGNING ON POINT PAPER,

and when the first question confronting the designer is the selection of the proper designing paper for a certain fabric, since it is this point paper in addition to the size of Jacquard machine to be used, which designates the size for the sketch or drawing. Which kind of point paper to use is regulated by the finished texture of the cloth to be made. If dealing with single cloth fabrics, the warp threads per one inch must be in the same proportion to the picks per one inch as the ruling off of the heavy squares on the point paper for the warp is to its ruling off for the filling.

Thus for example, a finished texture of fabric:—

100 warp threads and 100 picks per one inch, requires the use of a point paper ruled off even, i.e., 8 × 8, or 10 × 10, or 12 × 12, etc.

Again for example, a finished texture of fabric:—

120 warp threads and 80 picks per inch, calls for 12 × 8, 24 × 16, 8 × 12, or similar ruled off point paper.

Finding a fabric constructed with a finished texture of 80 × 60 will require point paper ruled 8 × 6, 12 × 9, 16 × 12 or any similar proportion of ruling off.

These three examples will readily explain the selection of the proper point paper for any kind of single cloth textile fabric. Now and then the finished texture of the fabric may be such as to be unable to get a proper ruling off of point paper—fractions may result; again the proper ruled off point paper may be impossible to be procured. In either case, select the point paper nearest to it to be had, and in turn draw your design out of shape on the point paper in order that in the finished fabric the affair will come up to the sketch. If dealing with more than single cloth the designer must thoroughly understand the construction of his fabric in order to be able to select the proper point paper, since in this case it is no more the texture of the cloth in question which designates the kind of point paper, but as you might call it, it is the "face design" which does it in this instance. He must know if dealing with 1 system warp, 2 systems filling; 2 systems warp, 1 system filling; 2 systems warp, 2 systems filling, etc., etc.

After having ascertained the proper point paper to be used and prepared the sketch for the fabric, the latter can now be transferred on the point paper and the design worked out ready for card stamping and in turn the loom.

HOW TO PREPARE THE POINT PAPER DESIGN.

This procedure will be best explained by means of the accompanying three illustrations, of which Fig. 1 shows the actual fabric sketch. The same refers to, for example, a silk dress good, although the affair is identical to similar fabrics executed either in cotton, wool, worsted. For the purpose of practically explaining the subject, we will consider the fabric in question to be executed with a texture of 171 warp threads and 171 picks to the inch. Examining our sketch, Fig. 1, we find that the same shows three repeats warp ways and two repeats filling ways.

In laying out the affair with reference to size of machine to use, we only have to take in consideration the width of one repeat of the pattern warp ways and which in the present example equals 1 3/4 inches. In turn multiplying 171 (warp texture) by 1 3/4 (width of one repeat in fabric) we get 299.2 and what practically equals 300 warp threads for one repeat of the pattern, equal 300 hooks in a 600 Jacquard machine, which in this instance will be the most practical machine to be used by a manufacturer. In the present example two repeats of the pattern will refer to one repeat of the machine since 300 × 2 = 600. Having ascertained what machine to use, i.e., number of hooks required for one repeat of the pattern, we next come to the proper selection of our point paper and which in the present instance, since warp and filling textures are equal, refers to a point paper squared off equally, for example, 8 × 8, 10 × 10, 12 × 12, etc., as the case may be. As previously referred to, we will need 300 warp threads for one repeat of the pattern and which equals 300 ÷ 8 = 37 1/2 heavy squares on the point paper.

The next to ascertain, is the number of picks required for one repeat of the pattern. Examining our sketch, we find that one repeat of the pattern length ways equals 2 3/4 inches and which affair if multiplied with picks per inch in the finished fabric (171) equals 467 picks, about, required for one repeat of the pattern.

Fig 1

The next to take in consideration is

THE ACTUAL NUMBER OF WARP THREADS AND PICKS TO USE

and what is determined by the ground weave employed. In the present instance we are, for example, to select the five harness satin for said ground weave.

Examining number of warp threads to be used, as previously explained 300, we will readily see that one repeat of the ground weave (5) can be divided in this number (300) and for which reason 300 warp threads or 37 1/2 heavy squares are correct with reference to width of design on point paper.

With reference to length of design on point paper, the number previously obtained was 467 picks, which number, however, cannot be divided equally by 5 and for which reason we

will have to either use 465 or 470 picks (i.e., a multiple of 5) for one repeat of the design length ways on the point paper; 470 we have selected in this case.

Having obtained exact repeat of the design on the point paper we next have to transfer one repeat of the design on sketch, enlarged, on the space as previously explained, to be used on the point paper.

Fig. 2 shows this affair, illustrating one figure (the lower left hand corner) of the sketch transferred (in outline) in this manner on 8×8 point paper. The affair is more readily visible in section A of said Fig. 2—showing outline affair only. The next thing to do is to dot said outline by means of squares called for, a feature readily explained by means of section B in Fig. 2. Judgment must be used in this work, the designer must carefully take in consideration which effect—warp or filling—is to get the benefit in chance of any dispute, in places where warp and filling effects come more or less near each other; especially when parts or figures nearly join, or in cut up effects in a figure; again the designer must take in consideration whether in such places warp or filling threads only float, or if figure and ground will come near each other in the shape of twills. As a rule the best plan is to follow outline as near as possible. The next procedure is to fill up the figure parts of the design completely with paint (vermilion); obtaining in this manner the design in a shape as shown in diagram C of Fig. 2.

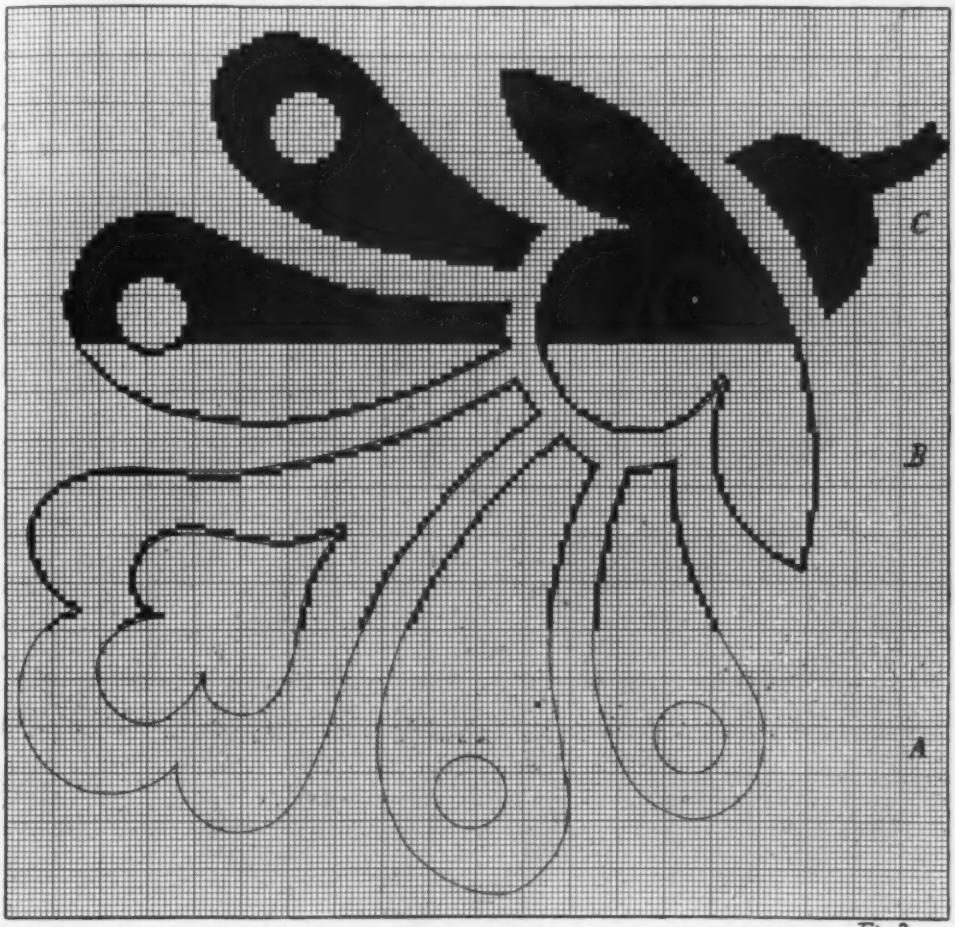


Fig. 2.

TO PUT THE WEAVE IN GROUND AND FIGURE is the next procedure, an affair readily explained by means of Fig. 3. In this instance we put the 5 leaf satin filling effect in the ground part of the design by means of painted squares (vermilion) and in the same way proceed with the figure part of the design, using

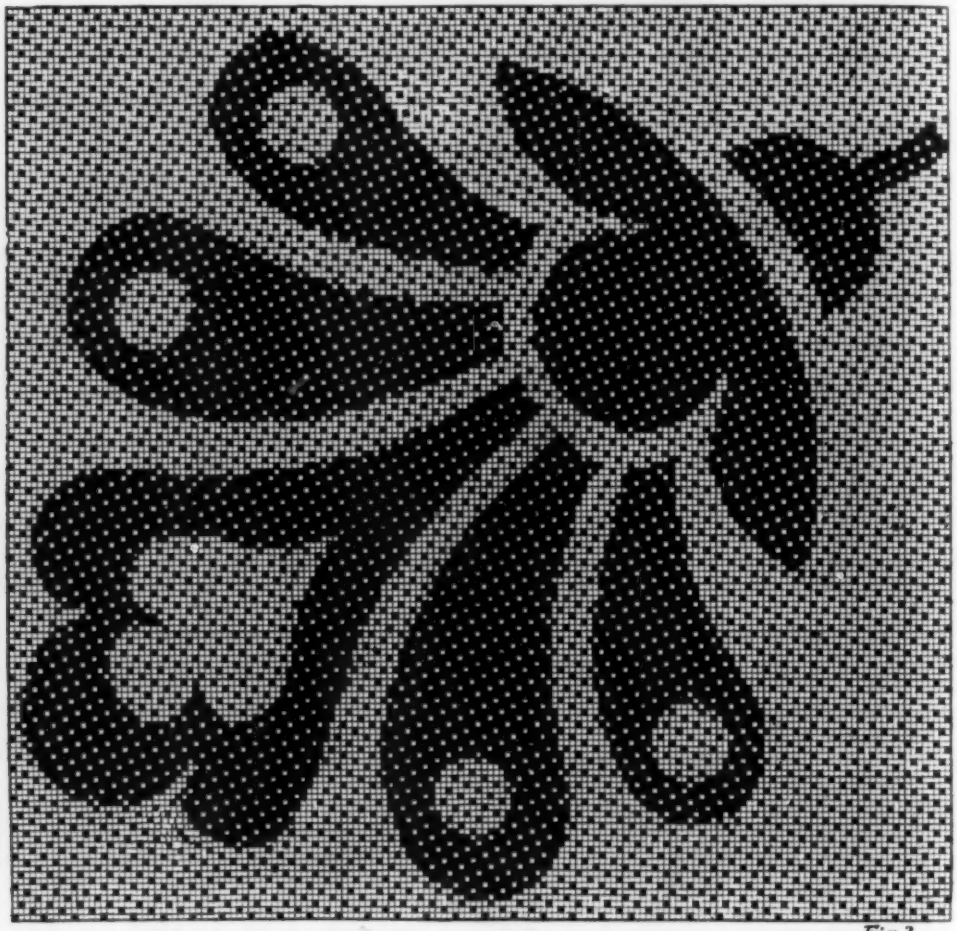


Fig 3

the same five leaf satin but painted in this instance with white paint on top of the vermilon. Having in this manner painted ground and figure part of the design with the 5 leaf satin warp or filling effect respectively, we next have to go carefully over the outlines of the figure, i.e., where ground and figure meet, and see that a perfect cut off between ground and figure is obtained. We also have to be careful that where warp or filling threads work on a straight line on outline of figure, that in this case the effect is carefully cut off by means of raisers opposite sinkers in order to give the outside thread a solid hold to the structure. This latter item is one of the points frequently neglected by designers and in such instances will always result in loose outlines for the figure. Having now the design completed we next must turn our attention to

CARD STAMPING,

a feature readily explained by means of diagram Fig. 4 representing a portion of a Jac-

quard card stamped from design Fig. 3, it being pick number 33 as indicated by a dash (—) on the left hand edge of design Fig. 3. Examining this portion of a Jacquard card we find the reading to be done for each and every row in the card from right to left as indicated by the numerals in said diagram. One of these cards is required for each pick of the design, the same as one bar for each pick in a harness loom. In a future article we will explain this principle of card stamping and only now want to mention that if the reader will carefully follow up pick number 33 from left to right on the design Fig. 3 as done by the card stamper and in turn examine portion of card as shown by diagram Fig.

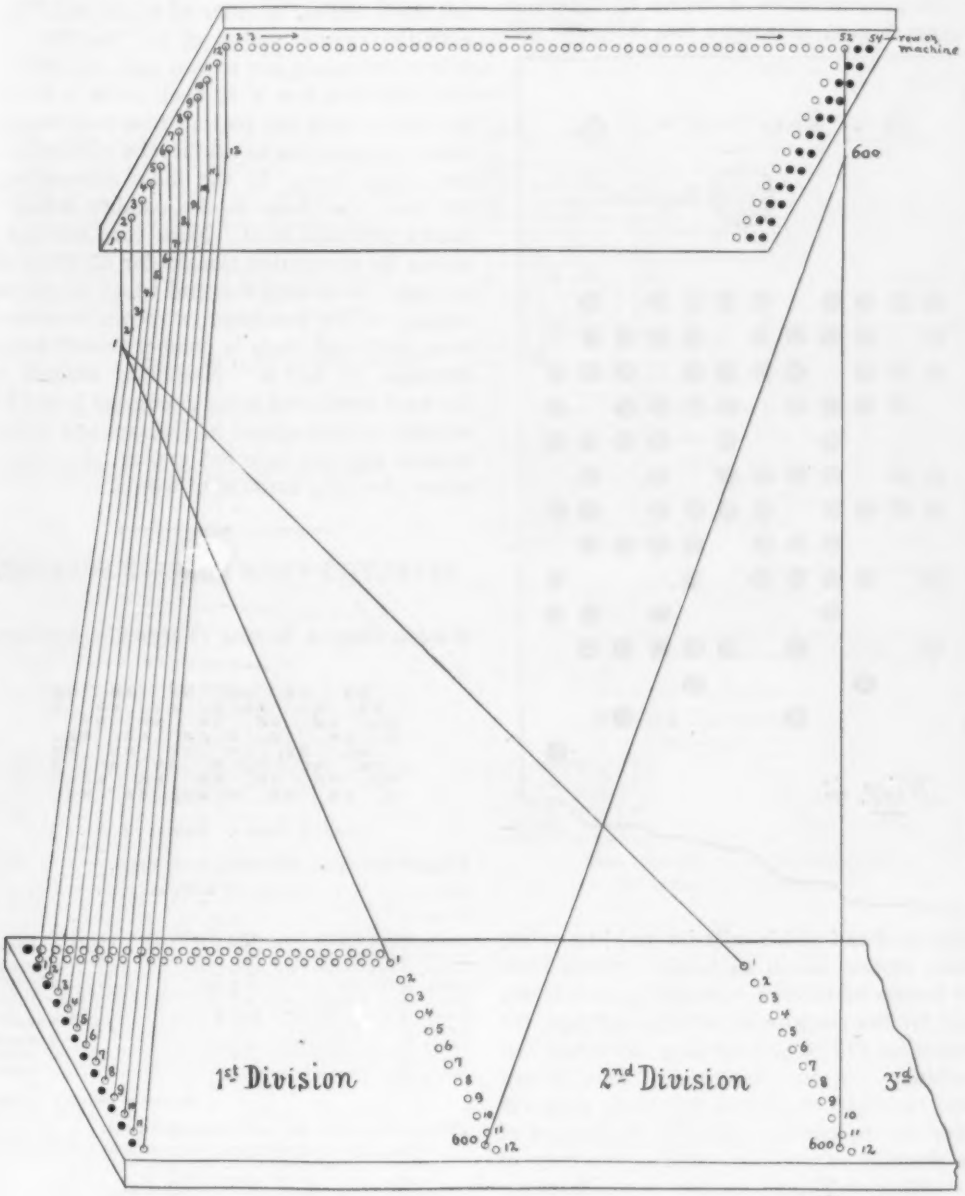


Fig. 5.

4, he will readily understand the affair, since both correspond, each row in the card calling for 1 1/2 squares on the design.

THE MOUNTING OF THE JACQUARD LOOM

for the present fabric is shown by means of diagram Fig. 5, showing a 600 Jacquard ma-

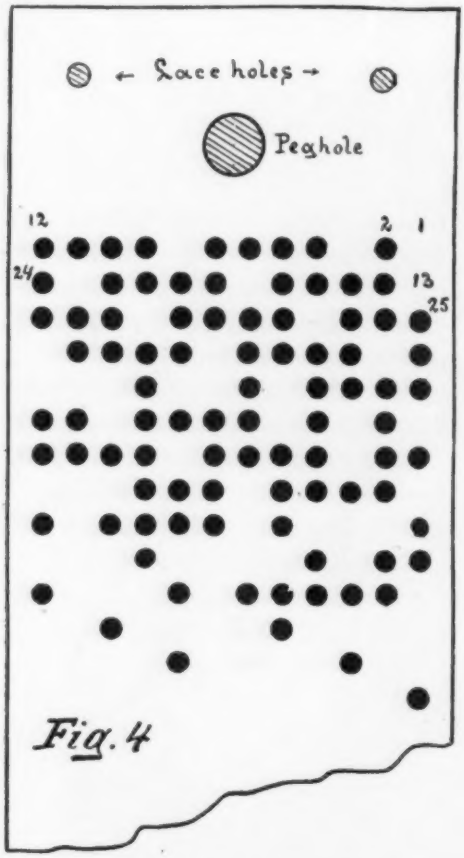
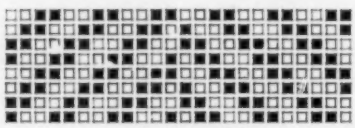


Fig. 4

chine used and which calls for $54 \times 12 = 624$ hooks and of which 24 hooks or two rows are known as reserve rows and generally are used for the purpose of weaving selvage, the remaining 52 rows comprising the actual 600 machine. In our design we have shown these two reserve rows in full black circles in order not to conflict with the 600 hooks of the machine as used for weaving the body of the fabric. These reserve rows however might be used also for weaving a portion of the fabric if required, a case frequently called upon, and in which instance any portion of them can be used in the regular tie-up. With reference to the comber board we have shown two full divisions and a portion of the third division. The rows in the comber board required for selvage have again been shown by full black circles, in order so as not to conflict with the regular tie-up of the machine and where the whole are shown only in outlines. Only the first row of 12 neck cords is shown, extending from the bottom board of the machine, in order not to conflict the student with two many lines. In the same manner only the first row deep in the comber board is shown threaded solid. Neck cord number 1 shows its connection (leash) for all three divisions. Neck cord 600 and which shows the ending of the machine, is shown connected to warp thread (hole in comber board) 600 in divisions 1 and 2. Numerals affixed to the neck cords and holes in comber board are selected to correspond in diagram and consequently can not help but explain the subject better than any amount of words.

NOVELTIES FROM FOREIGN SOURCES.

Woolen Cheviot Suiting (Large Check effect).



Complete Weave. Repeat 24 × 4.

Warp:—1,925 ends, 8-harness fancy draw.
Reed:—$13\frac{1}{2} \times 2 = 71$ inches wide in loom.
Dress:—

2 ends, 3¼-run woolen yarn, light gray	× 8 = 32 ends.
2 ends, 3¼-run woolen yarn, dark gray	
2 ends, 3¼-run woolen yarn, light gray	= 2 ends.
1 end, 3¼-run woolen yarn, dark gray	= 1 end.
1 end, 2/52's worsted black, with red knobs twisted on,	= 1 end.
2 ends, 3¼-run woolen yarn, light gray	× 8 = 32 ends.
2 ends, 3¼-run woolen yarn, dark gray	
2 ends, 3¼-run woolen yarn, light gray	= 2 ends.
1 end, 3¼-run woolen yarn, dark gray	= 1 end.
1 end, 2/52's Cheviot worsted, green	= 1 end.
Repeat of pattern:	72 ends.

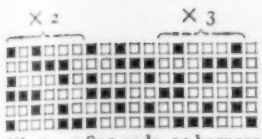
Filling:—29 picks per inch, arranged thus:

1 pick, 2/52's worsted black, with red knobs twisted on.
39 picks, 3¼-run woolen yarn, dark gray mix.
1 pick, 2/52's Cheviot worsted, red.
39 picks, 3¼-run woolen yarn, dark gray mix.

80 picks in repeat of pattern.

Finish:—Cheviot finish; scour well, clip on shear, steam, press; finished width 56 inches.

Worsted Trousering.



Complete Weave.
Repeat 36 × 6.

Warp:—7,895 ends, 12-harness fancy draw.

Reed:—40 × 6 = 65½ inches wide in loom.

Dress:—

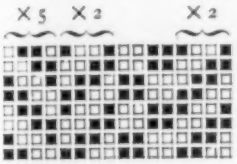
2 ends, 2/52's worsted, black.
10 ends, 2/52's worsted, black and dark gray twist.
1 end, 2/64's worsted, black and white twist.
1 end, 2/64's worsted, dark drab and 200/2's, white silk.
2 ends, 2/52's worsted, black.
2 ends, 2/52's worsted, black and black and orange mix twist.
1 end, 2/64's worsted, black and white twist,
1 end, 2/64's worsted, dark drab and 200/2's white silk.
10 ends, 2/52's worsted, black and dark gray twist.
2 ends, 2/52's worsted, black.
1 end, 2/64's worsted, black and white twist.
1 end, 2/64's worsted, dark drab and 200/2's white silk.
1 end, 2/64's worsted, black and white twist,
1 end, 2/64's worsted, dark drab and 200/2's white silk.

30 ends in repeat of pattern.

Filling:—66 picks per inch, all plain, 2/64's worsted, black.

Finish:—Worsted finish; 56 inches wide.

Woolen Cheviot Suiting (Stripe effect).



Complete Weave.
Repeat 40 × 8.

Warp:—2,320 ends, 8 harness fancy draw.

Reed:—18½ × 2 = 62½ inches wide in loom.

Dress:—

2 ends, 4-run woolen yarn white.....
2 ends, 2/64's worsted white, and brown woolen yarn with fancy knobs twist..... } × 2 = 8 ends.

1 end, 4-run woolen yarn white.....
1 end, 2/64's worsted white and 2½-run woolen yarn, black, twist..... } × 4 = 8 ends.

2 ends, 4-run woolen yarn white.....
2 ends, 2/64's worsted white, and brown woolen yarn with fancy knobs twist..... } × 8 = 32 ends.

1 end, 4-run woolen yarn white.....
1 end, 2/64's worsted white and 2½-run woolen yarn, black, twist..... } × 3 = 6 ends.

1 end, 4-run woolen yarn white..... = 1 end.
1 end, 3-run woolen yarn green..... = 1 end.
2 ends, 4-run woolen yarn white.....
1 end, 2/64's worsted white, and brown woolen yarn with fancy knobs twist..... } × 3 = 6 ends.

1 end, 4-run woolen yarn white..... = 1 end.
1 end, 3-run woolen yarn blue..... = 1 end.
2 ends, 4-run woolen yarn white.....
2 ends, 2/64's worsted white, and brown woolen yarn with fancy knobs twist..... } × 4 = 16 ends.

Repeat of pattern: 80 ends.

Filling:—43 picks per inch, all 4-run woolen yarn, arranged thus:

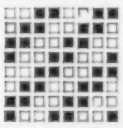
1 pick green.
7 picks black.
1 pick blue.
95 picks black.

104 picks in repeat of pattern.

Finish:—Cheviot finish; scour well, clip on shear, steam and press; 56 inches finished width.

L. of C.

Worsted Melton Suiting (Stripe).



Complete Weave.
Repeat 4 × 4.

Warp:—3,720 ends, 8 or 12-harness straight draw.

Reed:—14 × 4 = 66½ inches wide in loom.

Dress:—

1 end, 2/32's white cotton, mercerized..... = 1 end.
1 end, 2/45's worsted, black.....
1 end, 2/45's worsted, black and blue twist..... } × 2 = 4 ends.

1 end, 2/45's worsted, black .....
1 end, 2/45's worsted, black and green twist...
1 end, 2/45's worsted, black .....
1 end, 2/45's worsted, black and white twist...
1 end, 2/45's worsted, black .....
1 end, 2/45's worsted, black and blue twist.....
1 end, 2/45's worsted, black.....
1 end, 2/45's worsted, black and white twist... } × 2 = 16 ends.

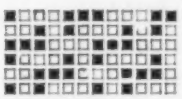
1 end, 2/45's worsted, black ..... = 1 end.
1 end, 2/45's worsted, black and green twist..... = 1 end.
1 end, 2/45's worsted, black ..... = 1 end.
1 end, 2/45's worsted, black and green twist..... = 1 end.
1 end, 2/45's worsted, black ..... = 1 end.
1 end, 2/45's worsted, black and blue twist..... = 1 end.
1 end, 2/45's worsted, black ..... = 1 end.
1 end, 2/45's worsted, black and white twist ..... = 1 end.
1 end, 2/45's worsted, black ..... = 1 end.
1 end, 2/45's worsted, black and green twist ..... = 1 end.
1 end, 2/45's worsted, black ..... = 1 end.
1 end, 2/45's worsted, black and white twist ..... = 1 end.
1 end, 2/45's worsted, black. ..... = 1 end.
1 end, 2/45's worsted, black and blue twist..... = 1 end.
1 end, 2/45's worsted, black ..... = 1 end.
1 end, 2/45's worsted, black and white twist..... = 1 end.
1 end, 2/45's worsted, black ..... = 1 end.
1 end, 2/45's worsted, black and green twist..... = 1 end.
1 end, 2/45's worsted, black ..... = 1 end.

Repeat of pattern: 40 ends.

Filling:—58 picks per inch, all plain, 2/45's worsted, black.

Finish:—Worsted Melton finish; full slightly during scouring, clip on shear, steam and press; 56 inches finished width.

Worsted Trousering.



Complete Weave.
Repeat 6 × 6.

Warp:—8,140 ends, 12 or 18-harness straight draw.

Reed:—21 × 6 = 64½ inches wide in reed.

Dress:—

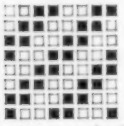
1 end, 140/2's silk, heliotrope.
1 end, 2/52's worsted, mix.
2 ends, 2/52's worsted, dark gray, mix.
2 ends, 2/52's worsted, black and orange twist.
2 ends, 2/52's worsted, dark gray mix.
1 end, 140/2's silk, heliotrope.
1 end, 2/52's worsted, mix.
2 ends, 2/52's worsted, dark gray mix.
22 ends, 2/52's worsted, gray and white twist.
2 ends, 2/52's worsted, dark gray mix.
1 end, 140/2's silk, heliotrope.
1 end, 2/52's worsted, mix.
2 ends, 2/52's worsted, dark gray mix.
2 ends, 2/52's worsted, black and blue twist.
2 ends, 2/52's worsted. dark gray mix.
1 end, 140/2's silk, heliotrope.
1 end, 2/52's worsted, mix.
2 ends, 2/52's worsted, dark gray mix.
22 ends, 2/52's worsted, gray and white twist.
2 ends, 2/52's worsted, dark gray mix.

72 ends, repeat of pattern.

Filling:—70 picks per inch, all plain, 2/64s, worsted, black.

Finish:—Worsted finish; 57 inches finished width.

Worsted Melton Suiting (Stripe effect).



Complete Weave.
Repeat 4 × 4.

Warp:—4,032 ends, 8 or 12-harness straight draw.
Reed:—15 × 3 = 67 inches wide in loom.
Dress:—

1 end, 2/45's worsted, black and green twist..... = 1 end.
1 end, 2/52's worsted black..... = 1 end.
1 end, 2/45's worsted black and green twist..... = 1 end.
1 end, 2/52's worsted, black.....
1 end, 2/52's worsted, black and white twist....
1 end, 2/52's worsted, black.....
1 end, 2/45's worsted, black and yellow twist... } × 11 = 44 ends.
1 end, 2/52's worsted, black..... = 1 end.
1 end, 2/45's worsted, black and green twist..... = 1 end.
1 end, 2/52's worsted, black. ..... = 1 end.
1 end, 2/45's worsted, black and green twist..... = 1 end.
1 end, 2/52's worsted, black .....
1 end, 2/52's worsted, black and white twist. .
1 end, 2/52's worsted, black.....
1 end, 2/45's worsted, black and yellow twist... } × 3 = 12 ends.
1 end, 2/52's worsted, black ..... = 1 end.
1 end, 2/52's worsted, black and white twist..... = 1 end.
1 end, 2/72's worsted, red ..... = 1 end.
1 end, 2/45's worsted, black and yellow twist..
1 end, 2/52's worsted, black.....
1 end, 2/52's worsted, black and white twist...
1 end, 2/52's worsted, black. ..... } × 3 = 12 ends.
1 end, 2/45's worsted, black and yellow twist..... = 1 end.
1 end, 2/72's worsted, olive..... = 1 end.
1 end, 2/52's worsted, black and white twist...
1 end, 2/52's worsted, black.....
1 end, 2/45's worsted, black and yellow twist..
1 end, 2/52's worsted, black..... } × 4 = 16 ends.

Repeat of pattern: 96 ends.

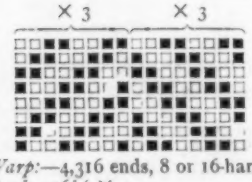
Filling:—70 picks per inch arranged thus:

1 pick, 2/72's worsted, red.
7 picks, 2/52's worsted, black.
1 pick, 2/72's worsted olive.
103 picks, 2/52's worsted, black.

112 picks in repeat of pattern.

Finish:—Worsted Melton finish; full slightly during scouring, clip on shear, steam, press; 56 inches finished width.

Worsted Melton Suiting.



Complete Weave.
Repeat 48 × 4.

Warp:—4,316 ends, 8 or 16-harness fancy draw.
Reed:—16½ × 4.
Dress:—

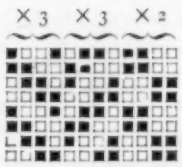
1 end, 2/56's worsted, fancy .....
1 end, 2/56's worsted, black and pearl twist, } × 10
1 end, 2/56's worsted, black and pearl twist.....
2 ends, 2/56's worsted, brown.....
1 end, 2/180's cotton, red..... } × 3 = 72 ends.
1 end, 2/56's worsted, fancy..... } × 10 = 20 ends.
1 end, 2/56's worsted, black and pearl twist.....
2 ends, 2/56's worsted, black and pearl twist..... = 2 ends.
1 end, 2/56's worsted brown..... = 1 end.
1 end, 2/56's worsted, green..... = 1 end.

Repeat of pattern: 96 ends.

Filling:—70 picks per inch, all plain, 2/56,s worsted, black.

Finish:—Worsted Melton finish; full slightly during scouring, clip on shear, steam, press; 56 inches finished width of cloth.

Woolen Cheviot Suiting.



Complete Weave.
Repeat 32 × 4.

Warp:—2,380 ends, 8-harness fancy draw.
Reed:—17½ × 2 = 68 inches wide in loom.
Dress:—

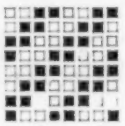
24 ends woolen yarn, dark gray mix.
1 end, 2/48's cheviot worsted yarn, blue.
6 ends, 4-run woolen yarn, dark gray mix.
1 end, 2/48's cheviot worsted yarn, red.

32 ends, repeat of pattern.

Filling:—42 picks per inch, all plain, 4-run woolen yarn, black and fancy mix.

Finish:—Woolen Cheviot finish; scour well, full slightly, clip on shear.

Worsted Suiting (Stripe effect).



Complete Weave.
Repeat 4 × 4.

Warp:—5,670 ends, all 2/72's worsted yarn, 8 or 12-harness straight draw.
Reed:—22 × 4 = 64½ inches wide.
Dress:—

2 ends, gray mix..... = 2 ends,
1 end, dark gray ..... = 1 end,
1 end, white .....
1 end, dark gray..... } × 4 = 8 ends,
1 end, gray mix.....
1 end, dark gray..... } × 2 = 4 ends,
1 end, white .....
1 end, dark gray..... } × 4 = 8 ends,
1 end, dark gray..... = 1 end, } × 4 = 96 ends.
2 ends, gray mix. ..... = 2 ends.
1 end, dark gray..... = 1 end.
1 end, white .....
1 end, dark gray..... } × 4 = 8 ends.
1 end, gray mix.....
1 end, dark gray..... } × 2 = 4 ends.
1 end, white.....
1 end, dark gray..... } × 3 = 6 ends.
1 end, white..... = 1 end.
2 ends, blue..... = 2 ends.
2 ends, gray mix..... = 2 ends.
1 end, dark gray..... = 1 end.
1 end, white .....
1 end, dark gray..... } × 4 = 8 ends.
1 end, gray mix.....
1 end, dark gray..... } × 2 = 4 ends.
1 end, white .....
1 end, dark gray..... } × 3 = 6 ends.
1 end, white..... = 1 end.
2 ends, brown..... = 2 ends.

Repeat of pattern: 144 ends.

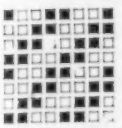
Filling:—90 picks per inch, all 2/72's worsted yarn, arranged thus:

2 picks, brown ..... = 2 picks.
2 picks, gray mix.....
2 picks, dark gray..... } × 5 = 20 picks.
2 picks, gray mix..... = 2 picks.
2 picks, blue..... = 2 picks.
2 picks, gray mix.....
2 picks, dark gray..... } × 35 = 140 picks.
2 picks, gray mix..... = 2 picks.

Repeat of pattern: 168 picks.

Finish:—Worsted finish; 56 inches finished width.

Worsted Suiting (Stripe effect).



Complete Weave.
Repeat 4 × 4.

Warp:—2,980 ends, 8-harness straight draw.
Reed:—15½ × 3 = 64 inches wide in loom.
Dress:—

2 ends, 2/36's worsted, black....
1 end, 6 ply fancy worsted (cord effect)..... } × 7 = 21 ends,
2 ends, single 36's, worsted, black and 200/2's white silk twist..... } × 5 = 72 ends.
1 end, 6-ply fancy worsted (cord effect).....
2 ends, 2/36's worsted, black.....
1 end, 6 ply fancy worsted (cord effect)..... } × 2 = 6 ends.
1 end, 2/36's worsted, black..... = 1 end.
1 end, 2/52's worsted, black and blue twist.....
1 end, 6-ply fancy worsted (cord effect).....
1 end, 2/36's worsted, black..... } × 3 = 9 ends.
1 end, 2/36's worsted, black..... = 1 end.
1 end, 6-ply fancy worsted (cord effect)..... = 1 end.
2 ends, 2/36's worsted, black..... = 2 ends.
1 end, 2/72's worsted, fancy twist..... = 1 end.
2 ends, single 36's worsted, bl'k and 200/2's white silk, = 2 ends.
1 end, 6 ply fancy worsted (cord effect)..... = 1 end.

Repeat of pattern: 96 ends.

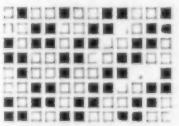
Filling:—62 picks per inch, arranged thus:

2 picks, 2/36's worsted, black.....
1 pick, 2/52's worsted, black and blue twist } × 3 = 12 picks.
1 pick, 2/36's worsted, black .....
92 picks, 2/36's worsted, black..... = 92 picks.

Repeat of pattern: 104 picks.

Finish:—Worsted finish; 56 inches wide.

Worsted Suiting.



Complete Weave.
Repeat 12 × 4.

Warp:—5,120 ends, 12-harness straight draw.
Reed:—20 × 4 = 64 inches wide in loom.
Dress:—

5 ends, 2/64's worsted, black.
1 end, 2/64's worsted, black and white twist.
1 end, 2/64's worsted, black.
1 end, 2/52's worsted, gray mix.
1 end, 2/64's worsted, black.
1 end, 2/64's worsted, black and white twist.
1 end, 2/64's worsted, black.
1 end, 2/52's worsted, gray mix.

12 ends in repeat of pattern.

Filling:—83 picks per inch, arranged thus:

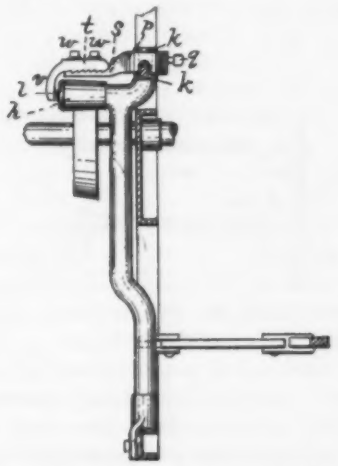
1 pick, 2/52's worsted, gray mix.
1 pick, 2/64's worsted, black.
1 pick, 2/64's worsted, black and white twist.
1 pick, 2/64's worsted, black.
1 pick, 2/52's worsted, gray mix.
1 pick, 2/64's worsted, black.
1 pick, 2/64's worsted, black and white twist.
5 picks, 2/64's worsted, black

12 picks in repeat of pattern.

Finish:—Worsted finish; 56 inches wide.

A NEW PICK BALL HOLDER.

The object of the new holder is to do away with a direct attachment and provide means which serve to keep the ball from dropping or slipping off the stud, not affected by the relative movement of the ball or by the jar produced by the pick cam.



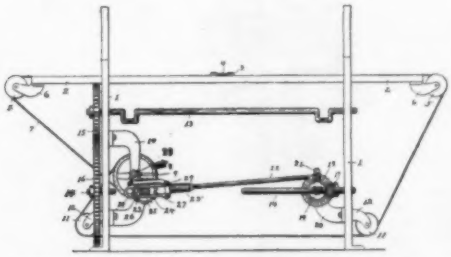
The accompanying illustration is a top plan view of the pick cam and shaft, showing the application and construction of the holder.

Examining this illustration it will be seen that instead of holding the pick ball h on the stud by means of a nut, an adjustable stationary guard is provided, consisting of a bracket whose shank portion p is secured by a nut q to and around the tubular portion of the pick shaft stand k and whose arm portion s extends horizontally, and has one surface toothed in order to adjustably support the guard proper, the latter consisting of the correspondingly toothed main portion t, and the hook portion v, which bends at substantially right angles with said main portion t, so that when the said guard t v is secured to the arm p s by means of bolts w, said hook portion v extends horizontially over or in front of the pick ball h and the end of the stud l and out of contact with both, said hook portion being sufficiently broad, to guard the pick ball in the positions assumed during its vibration.

KNIFE SLED MOTION FOR PILE FABRIC LOOMS.

The object is to make an improved motion for operating the carrier and knife positive and steady.

The accompanying illustration shows a portion of a loom frame, the crank and bottom shaft and the new knife sled motion applied thereto.



A DESCRIPTION OF THE CONSTRUCTION AND OPERATION

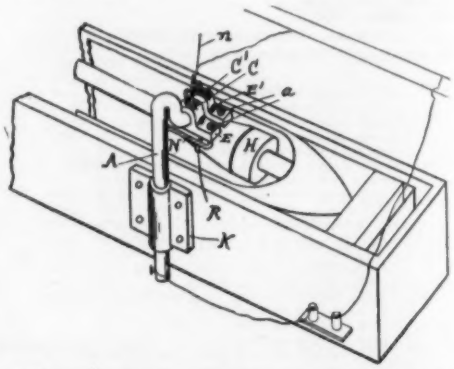
of the new motion is best given (by consulting the illustration), quoting numerals of references accompanying the same and of which 1 represents the loom frame, 2 the guideway for the carrier 3, having the knife 4 attached thereto. At one end of the guideway 2 is a guide pulley 5 and at the other end a corresponding guide pulley 5'. Each pulley 5 and 5' is mounted in a bracket 6, secured to the under side of the guideway 2. A cord 7 is attached at one end to the carrier 3 and passes over the guide pulley 5 and is wound several times around a drum 8, fast on a short shaft 9, mounted in a bracket or hanger 10, secured to the loom side. From the drum 8 the cord 7 passes over the guide pulleys 11 and 11', each mounted in a bracket 12, secured to the loom frame, and over the pulley 5' to the carrier 3, to which it is attached.

The crank-shaft 13 is geared to the bottom shaft 14, on which is fast a bevel pinion 17, which meshes with a bevel gear 18, fast on a short shaft 19, mounted in bearings on the stand 20, secured to the loom frame. On the shaft 19 is fast a crank arm 21, to which is pivotally connected one end of a connector or rod 22, the other end of which is secured to the end 23' of a rack 23, the teeth of which mesh with a pinion 24 on a short shaft 25, mounted in bearings in a stand 26, secured to the loom frame. The pinion 24 has an extended hub on each side, and on the shaft 25 is fast a gear 27, which meshes with a pinion 28, fast on the shaft 9 of the drum 8. In connection with the rack 23 and pinion 24 two detachable slotted guide-plates 29 are used one on each side of the rack 23. The extended hub on the pinion 24 extends through and fits in the slotted portion of the guide-plates 29, and said plates 29 hold the rack 23 in its proper position relative to the pinion 24 as said rack is moved back and forth by the movement of the crankarm 21 to rotate the pinion 24 first in one direction and then in the other and thus communicate through gear 27 and pinion 28 a rotary motion to the drum 8 and through cord 7 a sliding motion to the carrier 3 and knife 4 first in one direction and then in the other on the guideway 2.

ELECTRIC FILLING FEELER FOR AUTOMATIC LOOMS.

The novelty consists in a new mode of constructing the feeler device that comes in contact with the thread on the bobbin in the shuttle to insure its making a proper contact therewith regardless of the exact positions of the bobbin and without any risk of injuring the thread.

The illustration is a part of a shuttle box of a loom with enough of the shuttle and bobbin to show the position of the feeler when in use.



The new device consists of a rod A having a turn made in its upper end. Two bars EE' are made, each bar being provided with a hub CC' on its upper side, and holes to fit easily on the main rod A. The hub C has a layer of electrically-insulating material put around inside its hole to insulate the bar from the rod A. The bars E and E' also have vertical

holes a made through them near their ends, wire loops or staples N being made to slide loosely up and down in the holes a, having small knobs on their upper ends to prevent them from slipping out of the holes when the bars are raised from the bobbin. A guide-plate K is made fast to the front of the shuttle-box, and the rod A is fitted to slide up and down freely in a groove in the plate to receive a short vertical motion as the lay beats up by means of a connection (not shown) with some portion of the running mechanism of the loom.

ELECTRICAL CONNECTION.

The bar E and its wire N are connected to one of the electric-circuit wires that run along over the loom by a separate wire n, connected to the hub C, and the bar E' is connected, through the rod A and the operating connections of that rod with a wire, to the other wire of the overhead circuit. When in the beating up of the lay of the loom the rod A and the bars and wires N drop on the bobbin H in the shuttle, if there is thread enough on the bobbin to cover the metal ring R, which is held on the bobbin, the loom will continue to run; but if the thread is so nearly run out as to expose the ring R, so that the wires N will come in contact with it, the circuit between the two overhead wires will be closed thereby, and an electromagnet included in that circuit energized and in turn the loom be stopped.

ACTION OF LICKER-IN IN REVOLVING FLAT CARD.

In feeding the cotton to the licker-in, the action thus imparted to the cotton, is identical to placing said cotton lightly in the path of a body of coarse moving combs. It will be readily understood by the reader that serious damage would result should the cotton be pressed somewhat forcibly against the teeth of the licker-in, a feature overcome by making the front portion of the "dish plate" of a peculiar shape, and when such damage in turn can only arise through imperfect adjustment, damaged feed plate, lap too heavy, or the cotton of longer staple than the plate is adapted for.

If for example the lap as fed to the card should be too heavy, the cotton is thus unduly pressed into the action of the teeth of the licker-in, resulting in turn in damage to the fibre caused by the excessive friction with such a rough surface as the teeth of the licker-in will present to the cotton. When such damage is prevalent, it may be detected by the presence of the little curled clusters of fibre in the fringe of the lap.

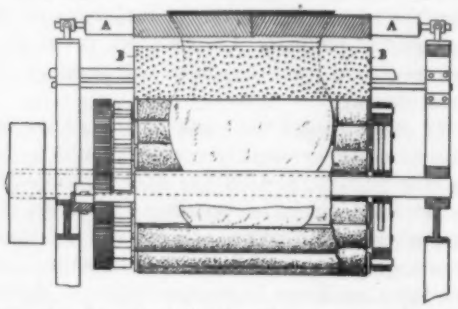
If again the staple is too long an examination of the fringe of the lap as it projects from the feeding arrangements is the only means of detecting this. To do this, loosen the fastenings of this part, and draw the same back a short distance, and this in such a way as not to disturb the fringe of cotton as acted upon by the licker-in. If the feed plate was adapted to the kind of cotton under operation, the ends of the longest fibres in the fringe of cotton will project to a point opposite the most protuding part of the dish plate, and are easily withdrawn, whereas if this is not the case, i.e., the resistance to their withdrawal more than likely is due to the resistance of the fibres about them, it is a sign that the dish plate is not adapted to the kind of cotton under operation, the extra grip upon the fibre being due to the pressure of the feed roller on the other end of these fibres. When again the staple of the cotton under operation is shorter than the plate is adapted for, the fibres are liable to be detached from the lap in numerous bodies instead of singly, which in turn causes the web when taken from the doffer to have a "cloudy" appearance. When this is the fault it will be noticed that the cotton passes on the underside of the licker-in in patches. Of the three faults thus referred to, a too heavy feed will produce the most damage.

In order to get the most benefit of the action of the licker-in, the cotton should be fed to it gradually, so that the fibre is subjected to as little strain as possible and when the cleansing and carding actions will be more thoroughly accomplished. At the same time the lap should not be thicker than the licker-in can effectively treat, nor lighter than the maximum amount possible, since by using a maximum feed, it allows the feed to be run at the lowest rate for any given amount of production. If once the maximum feed has

been ascertained, the weight of the laps should not be altered, said weight varying from 9 ozs. to 16 ozs., according to width as well as make of card and the kind of cotton used.

AN IMPROVEMENT TO NAPPERS FOR TUBULAR KNIT FABRICS.

The general method of napping tubular knit fabrics having contracted portions at intervals, is to pass the fabric under operation through an ordinary napping machine in the same manner as a single thickness of cloth. When thus passed through an ordianry napping machine, the napping rollers raise a nap upon the surface of the material with which they come in contact; but they do not contact with and produce a nap on all of the surface, because as the tubular fabric passes through, the under layer, being acted upon by the napping rollers, is stretched more than the upper layer, with the result that the upper layer becomes loose and flabby and forms large wrinkles, which permit wrinkles to form beneath them in the under layer, thus causing folds in the under layer, the inner sides of which folds cannot be reached by the napping rollers. Frequently the wrinkles formed are so large and heavy that the napping rollers catch into them and tear the goods. The contraction of the tubular fabric at intervals also tends to prevent the napping rollers from acting against and producing a uniform nap. To overcome this disadvantage is the purpose of the improvement to nappers



thus to be described, the accompanying illustration showing in section a portion of a napper having the new device applied thereto.

Examining this illustration it will be seen that the fabric to be napped, after passing the stretching roller A (which keeps the fabric stretched to its full width) passes under a roller B which has its surface covered with tin, having raised projections. This roller B has its rotation retarded by means of a brake band (not shown) and thus it will be seen that this roller B by retarding the upper layer of the fabric sufficiently to draw the same tight, will preclude the formation of wrinkles in said upper layer, and consequently leave no place for wrinkles to form in the under layer; also, that the piece of goods will be held under uniform tension, while the roll A by stretching the material in the direction of the width insures a uniform nap on the fabric from edge to edge.

CARD CLOTHING AND GRINDING.

As an aid in judging card clothing, it may be said that the foundation should be firm, not too hard, and with considerable elasticity; the tooth should not leave it at a more acute angle than 75 deg., the point of the tooth should never be more than 3 deg. to 5 deg. in advance of the vertical line, and the point of the tooth when ground should take and retain a keen edge. For special work, with full knowledge of the conditions, difference on these points is permissible.

If steel tempered wire is used, two hours grinding every three weeks will be sufficient to keep doffer and cylinder in good condition. With reference to the flats six hours every three months will keep them in order. Burnishing should follow each grinding. As to the length of time running on the wire, the carder will have to use his own judgment. If the wire is side ground, grind with the emery just enough to keep it true and straight and sharpen with burnisher brush.

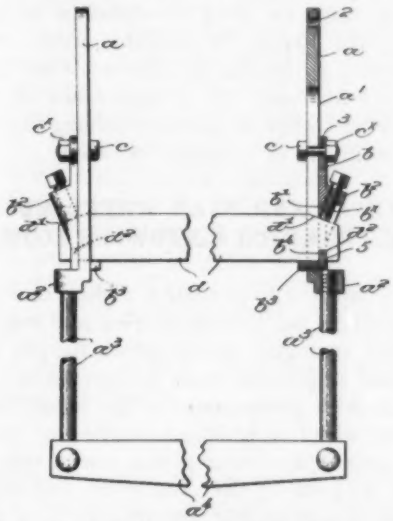
HARNESS ADJUSTING MECHANISM FOR DRAPER LOOMS.

The object is the production of means whereby the harness support may be readily adjusted longitudinally of the harness frame without necessitating a change or adjustment of the straps by which the frames are suspended.

The accompanying illustration is a front

elevation, partly broken out and in section, of a harness frame provided with the new adjusting mechanism the heddles being omitted.

The harness frame comprises parallel flat side bars a, longitudinally slotted at a′ for a



portion of their length and having at their lower ends threaded hubs a^2, into which are screwed the rods a^3, the lower ends of the latter being suitably secured to the bottom bar a^4, to which the cam treadle (not shown) is connected. The overhead straps (not shown) are attached to the upper end of the side bars, holes 2 therein being provided for the purpose. Slides b are mounted on the outer faces of the said bars and near their lower ends are provided with openings b′ opposite or registering with the slots a′, and each slide has a lateral extension b^2 above its opening, provided with a threaded hole to receive a screw bolt b^x. A clamp bolt c has its shank passed loosely through the slot a′ of the side bar and through a hole 3 in the slide, at the upper end thereof, a retaining nut c^x on the outer end of the bolt serving to clamp the slide and side bar securely together.

IN ORDER TO CONNECT

the lower end of each slide to the slide bar, a foot b^3, which is T-shaped in cross section, is provided, the stem of the foot passing through the slot a′ and being secured to the lower end of the slide by a screw 5. The head of the said foot engages the inner face of the side bar and serves to guide the slide in its movement.

THE HARNESS IS SUSTAINED

by a cross bar d, which is long enough to extend through the side bar slots a′ and the openings b′ of the slides, the cross bar being set on edge, as shown, and beveled along its upper edge at d′, adjacent its ends. Notches d^2 are made in the lower edge of the supporting bar to receive the lip like part b^4 of each slide at the bottom of its opening b′. This co-operation of the supporting bar and slides locks the parts together and prevents any relative lateral movement of the side bars of the frame.

WHEN IT IS NECESSARY TO ADJUST THE HARNESS VERTICALLY,

the clamping bolts c are loosened and the slides moved up or down on the side bars a to the desired height and then set up or clamped, thus easily permitting the getting an even shed.

If it is necessary to remove the supporting bar, it is only necessary to loosen the retaining screws, and the bar d can then be lifted to disengage it from the lips b^4 and drawn laterally out of the frame.

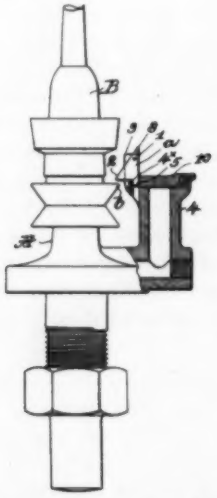
A NOVEL DOFFER GUARD.

The objects of the invention are to provide a spindle support with a doffer guard to hold the spindle in the bearing during the doffing and at the same time to prevent excessive movement of the spindle in the bearing before it is engaged by the guard to hold it therein and to make the doffer guard simple, easy of operation, and positive in action.

The accompanying illustration is a side elevation, partially in section, illustrating the application of the doffer guard.

The new device consists in the employment of a detent supported on the bolster case A, said detent having a projection adapted when a pull is exerted upon the spindle B in doffing to engage with the whirl carried by the spindle, means being provided to positively lock or hold such detent in operative position. The detent thus referred to consists of a

latch supported on a pivot mounted on an arm carried by the bolster case, having a member adapted to be projected over the whirl b of the spindle.



The detent, as clearly seen from the illustration, consists of a triangularly-shaped piece a, loosely supported upon a pin 1, upon which it is free to be turned. One corner 2 of this triangle is adapted to be projected forward over the protuberance b of the spindle, so that when a pull is exerted upon the spindle in doffing the whirl b will engage with the corner 2 of the detent and the spindle will be held thereby in its bearing. The pin 1 is mounted in ears 3, projecting from the oil-well 4, thus the centre of gravity of the detent a is so located with relation to the pin 1 that the detent normally tends to withdraw its corner 2 from over the whirl b of the spindle. Means are also provided to prevent the detent from being moved too far in the direction of the spindle, such means consisting of a pin 4^x, supported in the ears 3 and adapted to engage the depending lug 5 of the detent.

The detent is provided with a portion 8, which projects above the ears 3 and which is adapted to be engaged by the finger of the operator when it is desired to withdraw the detent from operative position, while the end of the doffer guard, adapted to project over the whirl on the spindle, is beveled, so that when the spindle is inserted the doffer-guard will be forced back and the spindle may enter its bearing without separate manipulation of the guard by the operator.

IN ORDER TO LOCK OR HOLD THE DETENT IN OPERATIVE POSITION,

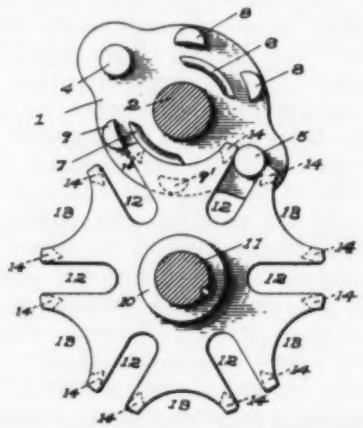
a pivoted block 10, adapted to be partially rotated upon its pivot to withdraw it from behind the detent, is provided, thus when withdrawn permitting the latter to be withdrawn from over the protuberance of the spindle and when in position holding the detent positively in operative position.

PINWHEEL AND STAR WHEEL MOTION FOR CROMPTON & KNOWLES LOOMS.

The object is to provide a motion in which the pinwheel has two driver pins and two oppositely arranged curved offset flanges and two pair of pins or studs to operate in connection with projections on the segments of the star wheel, to lock or hold the star wheel, when one of the driver pins is not in engagement with one of the slots in the star wheel.

The accompanying illustration is a side view of the new pin and star wheel motion.

In the same, 1 indicates the pinwheel se-



cured on a driven shaft 2, having two driver pins 4 and 5 extended out from the same side thereof upon opposite sides of the shaft 2. On the same side of the pinwheel 1 as the driver pins 4 and 5 are two curved flanges or extensions 6 and 7 upon opposite sides of the shaft 2 and intermediate the pins 4 and 5. Also on the same side of the pinwheel 1, on opposite

sides of the shaft 2 and outside of the flanges 6 and 7, are two pairs of pins or studs 8 8′ and 9 9′.

The star wheel 10 is keyed on a shaft 11 to communicate an intermittent motion to the pattern or box chain, and has six radial slots 12 in its periphery to be engaged by the driver pins 4 and 5. Intermediate the radial slots 12 the periphery of the star wheel 10 has the concave recesses or depressions 13, the curvature of which corresponds to the curvature of the two offset flanges 6 and 7. Upon the side or face of the star wheel 10 contiguous to the pinwheel 1 and at the outer or open ends of the radial slots 12 are projections 14, having their inner edges slightly curved. The width or thickness of the projections 14 is a little less than the distance between one of the offset flanges 6 and 7 and a pair of pins or studs 8 8′ or 9 9′, so that said projections can pass between the same.

IN THE OPERATION,

the continuous motion of the shaft 2 communicates a continuous revolution to the pinwheel 1, and the engagement of one of the driver pins 4 or 5 with a radial slot 12 in the star wheel 10 communicates a partial rotation to said star wheel, in this instance one-sixth of a revolution and then there is a dwell of the star wheel. The pinwheel 1, with the two driver pins 4 and 5, communicates two partial revolutions to the star wheel 10 at each complete revolution of said pinwheel.

By means of the two curved flanges 6 and 7 and the two pair of pins or studs 8 8′ and 9 9′ and the projections 14 on the star wheel 10, the star wheel is locked or held in position during the time it is stationary or when one of the driver pins 4 or 5 is not in engagement with one of the slots 12 in the star wheel.

WHEN BOTH OF THE DRIVER PINS, 4 AND 5, ARE OUT OF ENGAGEMENT

with the star wheel and at equal distances therefrom, the projections 14 on the edge of the star wheel will extend between one of the curved flanges 6 or 7 and one pair of pins or studs 8 8′ or 9 9′ on the pinwheel 1, and thus lock or hold the star wheel stationary. The continued revolution of the pinwheel 1 will cause one of the driver pins to enter one of the radial slots 12 in the star wheel 10, and at the same time one of the pairs of pins, as 8 will pass beyond the projection 14 on the star wheel and leave the star wheel free to be moved by the engagement of the pin 5 with the radial slot 12, and the continued revolution of the pinwheel 1 moves the star wheel 10 to carry the projection 14 on the star wheel 10 away from the curved flanges 6 and the pin or stud 8 and leaving the star wheel free to be turned by the revolution of the pinwheel. As the driver pin 5 passes out of the radial slot 12 in the star wheel 10 the projection 14 enters between the curved flange 6 and the pin or stud 8 to lock or hold the star wheel in position after the driver pin 5 passes entirely out of the radial slot 12.

Thus it will be seen that by means of two driver pins on the pinwheel two partial rotations are communicated to the star wheel at every complete revolution of the pinwheel, and by means of the curved flanges 6 and 7 and the pairs of pins or studs 8 8′ and 9 9′ the star wheel is firmly held or locked in position every time it comes to a stop.

CHANDLER'S SEPARATOR FOR SPINNING MACHINES.

In the operation of spinning, the ballooning of yarn passing from the guides of the thread board to the ring travelers being caused mainly by the length of yarn unsupported between these points and the centrifugal force imparted to the yarn by the rotation of the spindle requires for its limitation, the interposition of separators between the spindles while the ring rail is moving in the lower limits of its building traverse.

WHEN THE RING RAIL IS WORKING IN ITS INTERMEDIATE AND UPPER COPPING TRAVERSE

the separators are of no utility and can be dispensed with, while during the operation of doffing it is necessary that the separators be removed to permit of free access to the spindles for the removal of the cops. So, also, in piecing it is necessary that the separators be removed from between the spindles. For this reason the object of the new mechanism is to accomplish this removal automatically at

some predetermined point in the operation of the machine, at which point the distance between the thread board guide and the ring traveler has been so decreased that the ballooning of the yarn is not sufficient to cause interference with the yarn passing to the adjacent spindles.

Fig. 1 represents a vertical sectional view

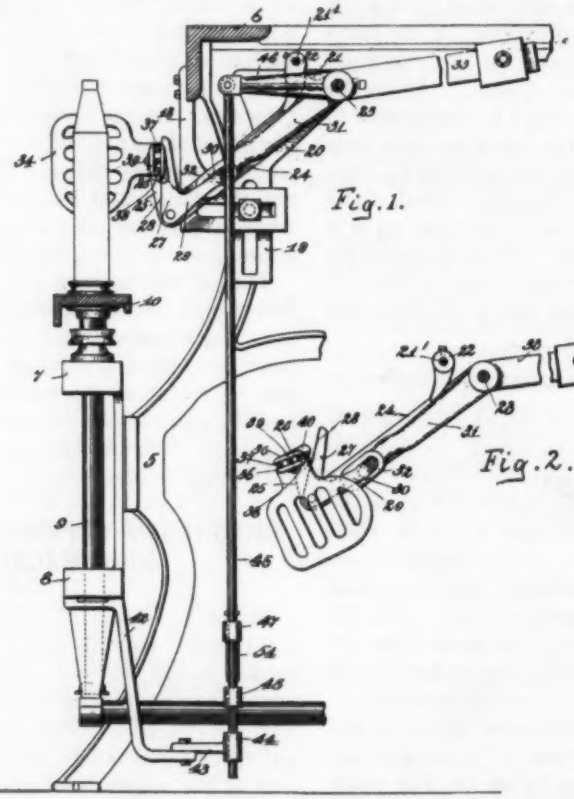


Fig. 1.

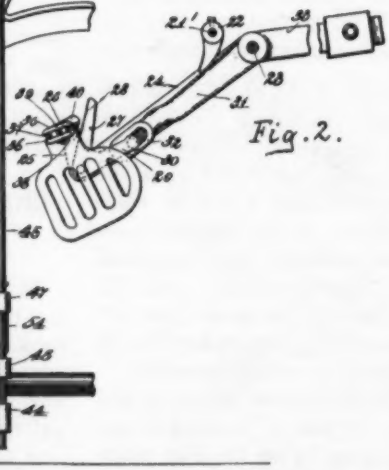


Fig. 2.

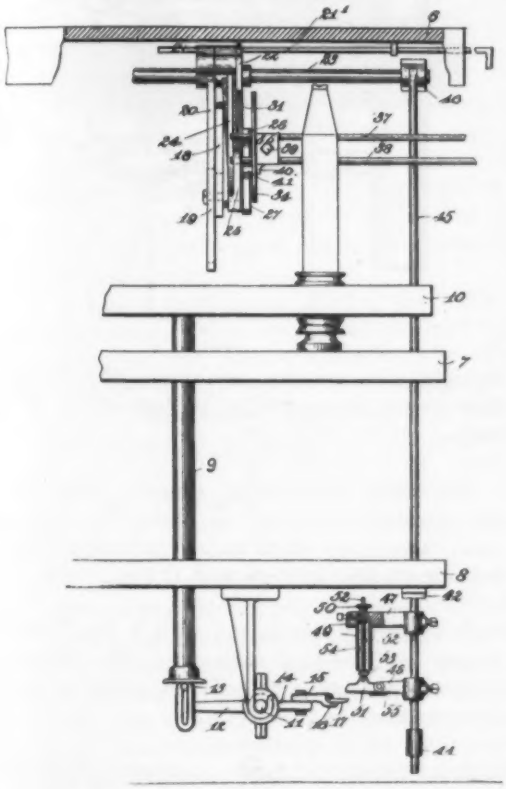
of portions of a spinning machine, illustrating the separator, its sustaining mechanism, and the tripper therefore. Fig. 2 represents a side elevation of the separator and its sustaining mechanism removed from the machine, the sustaining mechanism being in the tripped or released position and the separator turned under out of the operative position. Fig 3 represents a front elevation of a spinning machine provided with the improvement partially broken away, showing the relation of the tripper to the ring rail lifter lever and the construction of the tripper, also showing the separator in relation to its sustaining mechanism.

In the illustrations numeral of references 5 indicates the frame of a spinning machine carrying the roller beam 6 and the bolster rail 7 and lower rail 8, in which the lifter rods 9 are vertically reciprocal. On the lifter rods 9 is mounted in the ring tail 10, carrying the spinning rings, the bolster rail 7 being supplied with spindles.

TRAVERSE OF THE RING RAIL IS EFFECTED through the builder motion, of which 11 represents the rock shaft, and 12 the lifter arm or lever carrying the bearing 13, on which the lower end of the lifter rod 9 is supported. The rock shaft 11 is furnished with the arm 14, to which is secured the extension 15, having the step 16 and provided with the pivoted pawl 17, free to swing upward, but limited in its downward movement by the step.

To the roller beam 6 is secured a series of brackets 18, to which plates 19 are adjustably secured. These plates 19 have inclined arms 20, furnished at their upper ends with forward lateral extensions 21, in the bearing of

which is journaled the shaft 21', carrying fixed dogs 22, and with bearings in which a shaft is journaled. On the shaft 23 are fixed inclined separator levers 24, each having the upwardly extending end 25, in which is formed a slot 26, open at its end. At the juncture of the end 25 with the lever 24 is pivoted the jaw 27, having a straight edge 28 and an angularly disposed arm 29, carrying the pivot 30. On the shaft 23 is journaled the tripper lever 31, having the slotted end



32, in which the pivot 30 works, and the counterweighted arm 33, by means of which the tripper arm 31 is sustained against the dog 22 of the plate 19.

The separator blades 34 have lateral extensions 35, between which and the clamping plate 36 are secured the rods 37 and 38 by means of the screw 39. The plate 36 has the depending portion 40, furnished with the projection 41. A series of separator blades are thus secured to the rods 37 and 38, these rods extending the length of the machine and the rod 38 being journaled in the slots 26 of the lever ends 25. The straight faces 28 of the jaws 27 bearing against the projections 41 will force these projections outward by the action of the counterweighted arm 33 until the rod 38 is rotated in its bearings sufficiently to bring the rod 37 to bear against the faces 28 of the several jaws 27, and to position the separator blades in the operative position, as shown in Fig. 1.

From the lower rail 8 depends the bracket 42, to which is secured the arm 43, carrying the vertical bearing 44, and in this bearing the tripper rod 45 is free to reciprocate, said rod being pivoted at its upper end to the arm 46, which is fixed to the shaft 23. On the tripper rod are adjustably secured the brackets 47 and 48, the bracket 47 carrying the casing 49 and the axially perforated screw plug 50, the bracket 48, carrying the pivoted pawl 51, to which is pivoted the rod 52, which works through the perforation of the plug 51 and has the collar 53, between which and the plug is the expansion spring 54, and the pawl 51 being sustained by the stop 55. The brackets 47 and 48 are so adjusted and secured on the rod 45 that the vibration of the pawl 17 in the working of the rock shaft 11 during the lower traverse of the ring rail will not bring this pawl 17 into engagement with the pawl 51.

When, however, this pawl 17 moves in a greater arc, as the ring rail moves in its intermediate or upper traverse, the pawl 17 engages with the pawl 51 and lifts the same, and the spring 54 being proportioned to resist the swinging of the pawl 51 on its pivot the tripper rod 45 will be lifted in its bearing, thus moving upward the arm 46, rocking the shaft 23, and swinging upward the separator lever 24. As the lever 24 swings upward the pivot of the jaw 27 is carried upward therewith; but as the tripper lever 31 is held from movement by the dog 22 the jaw 27 will swing on its pivot, the pivot 30 of the arm 29 working in the slotted end of the tripper lever until the jaw has reached the position shown in Fig. 2, when the projection 41 being released from contact with the straight face of the jaw the weight of these separators will cause the rod 38 to rotate in its bearings until the separators turn under to the position

shown in Fig. 2. After the spinning has been completed the cops may be removed from the spindles without first turning the separators from between the spindles by hand. Before restarting the machine the separators are again turned upward by hand to the position shown in Fig. 1.

The pivoting of the pawl 17 permits it to swing upward on the downward movement of the arm extension 15, so this pawl 17 may pass the pawl 51 being pivoted and held in its normal position by the spring 54 to provide for a slight yielding of the pawl 51 to the impact of the pawl 17.

WHEN THE MACHINE IS UTILIZED FOR SPINNING WARP

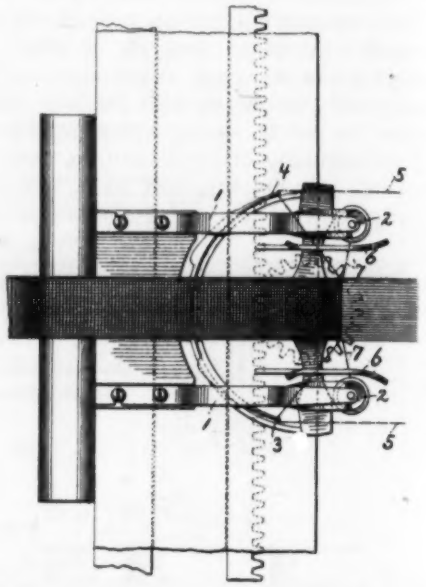
in which the building traverse extends for the whole length of the bobbin, shortening with each layer, the shaft 21′ is rotated to swing the dogs 22, upward out of contact with the arms 31. The separators may then be turned under by hand in the manner usual in turn under separators.

IMPROVEMENT IN NEEDLE LOOMS FOR NARROW GOODS.

The object is to provide means whereby the fabric can be woven rapidly, at the same time keeping a straight and even selvage.

The accompanying illustration is a top plan view of that part of a loom at which the filling is inserted.

Mounted on the lay on each side of the fabric being woven is a bracket 1, each of which carries on its end a spool carrier 2. The two filling inserting needles 3, 4 are in the shape of an arc and draw the filling end 5 from bobbins placed at the rear of the loom. Between the spool carriers 2 and edges of the fabric is mounted two guides 6 which are slotted for the reception of the filling end after inserting a pick. When either filling inserting needle passes through the shed, the spool carrier 2, is lowered so that the filling end passes over the selvage thread 7, and on the next movement of the same filling inserting needle through the shed, the spool carrier 2 is raised so that the filling end passes under the selvage thread 7, thus keeping the selvage



straight and in turn preventing the filling from being dragged in at the edge of the selvage.

According to official reports covering the period from July to December, 1902, there were 125 cotton mills in Mexico, containing 554,880 spindles and 17,725 looms.

In India the spinning of yarn is in a large degree confined to Bombay, the mills of that province producing 74 per cent. of the quantity produced in British India.

A noticeable fact is the continued increase in India of the production of yarn of counts higher than No. 20, which is as much as 84,000,000 pounds, being 15 per cent. of the whole production. In Bengal, the united provinces, and the Punjab the mills spin hardly any yarn above No. 20, yarn of that count and lower numbers representing 97 to 99 per cent. of the whole production. In Bombay, however, the spinning of the higher counts (above 20) is 18 per cent. of the whole, in the central provinces it is 17 per cent., and in Madras 12 per cent.

CORRESPONDENCE AND NOTES

Upon Textile Topics at Home and Abroad.

MILL LIFE IN ENGLAND.

Editor Textile World Record:

I notice that several correspondents in other textile papers have referred to a paragraph in my last article in the Textile World on the above subject and have inferred that I was giving something which was far from the facts, and I feel that I ought to explain the paragraph referred to.

I stated that nearly all the mill workers wear "clogs," and no one conversant with Lancashire mill towns will contradict this. As to the "roasted potato" part of the paragraph, I will acknowledge that it is somewhat misleading as it reads. I did not refer to what is usually called "supper" in America and "tea" in England, but to a later time of eating. I have a picture in my home now, taken in the town of Blackburn, of one of these potato engines. The man was on the street selling these same "roasted potatoes." I will acknowledge that many of the operatives have "chipped potatoes" in place of these "roasted" ones, but I fail to see the material difference. There is no doubt that they enjoy these little meals, as I saw many small places where the potato trade was flourishing, and I have seen people carrying home these "viands" at nearly 12 o'clock at night, intent on having a pleasant meal before retiring.

AN OBSERVER.

ORIGIN OF THE WORD "TWEED."

Technical School, Galashiels,
Scotland, March 14, 1903.

Editor Textile World Record:

I have just read Mr. Anderson's interesting article on the origin of the word "Tweed" in your January issue. I beg leave to point out a statement which is erroneous. The occurrence which he describes did not take place at Galashiels. In 1826 Messrs. Wm. Watson & Sons, Dangerfield Mills, Hawick, received an order for Scotch tweels from Messrs. Jas. Locke & Co., at that time the leading firm of woolen warehousemen in the West End, London. The rest of the story is as described by your correspondent. I knew a gentleman, now deceased, who as a boy was in the employ of Messrs. Watson when the above incident took place.

I may mention that the firm of Wm. Watson & Sons will reach their centenary as woolen manufacturers next year. In 1826 their weaving plant consisted of only 9 hand looms. In the succeeding generation the Scotch woolen trade had "caught on" and increased by leaps and bounds, but so deeply rooted was the prejudice of many Scotch manufacturers against the introduction of power machinery, that the same firm twenty years later was employing between 90 and 100 hand loom weavers in order to cope with the work in hand.

Originally "Scotch Tweed" was made so that 1 English ell warp or 45 inches, gave 1 Scotch ell (37 inches) finished cloth in length, and set 1 Scotch ell or 37 inches wide in reed and milled into 28 inches finished. No such rules exist now in the Scotch trade. "Scotch Tweed" is now the cloth that will "sell," irrespective of yarns, setting, and for that matter, quality too. But merchants can get as good value for their money in the lowland vales of Scotland as anywhere on the great round globe.

THOMAS OLIVER.

PROCESS OF FINISHING ZIBELINE.

[From L'Industrie-Textile, Paris.]

The firm of Hannart Freres, Roubaix, France, have discovered several new and very successful processes for dyeing and finishing dress goods during the past few years. Among these novelties may be mentioned, "teinture beige," "empreintes indestructibles," "teinture cameleon." The particulars regarding these processes have as far as possible been kept secret by the above named firm and used only for their own trade.

They have been very successful in the manufacture of zibelines, which are very popular at the present time and consist of mixtures of lustre wool and a ground material. Up to within a short time ago zibelines were fulled in order to give the fabric sufficient solidity to withstand the necessary gigging. Fulling the goods was objectionable because it served to obliterate the weave effects and also removed from the wool a portion of its brilliancy and soft and silky aspect.

The superintendent for the firm, Mr. Ed. Ribaucourt, has discovered a new method for finishing zibelines without fulling. In 1897 this firm adopted the treatment which they called "a crisping process by shortening the cotton," which was very satisfactory for obtaining relief effects. It is based on the property possessed by caustic soda of causing cotton to shrink, and not affecting the wool when the soda is used at a temperature below zero.

It is this principle that has been adopted in the new method of finishing zibeline. The cloth is not fulled at all and consequently the weave effects are not destroyed or impaired by the finishing process and the natural brilliancy of the raw material is retained.

The discovery is likely to prove of great importance and its application is as yet but faintly realized. By means of it a wooly finish can be obtained on very light goods making them appear like fur. This method, resulting from the ingenious application of a well-recognized principle, produces effects heretofore completely unknown on wool goods. It is expected that during the coming season the fabrics finished by the new process will be manufactured at Roubaix in large quantities. The three varieties of finish by this process have been named: "crispe zibeline," "crispe ondule," and "crispe zebre."

BURNING SOFT COAL WITHOUT SMOKE.

BY EBEN GOULD.

When I first went to the Merchant's Woolen Company's mills they were burning anthracite coal. A few years after they began using soft coal and as it was a new thing to me it seemed a very disagreeable thing to use on account of the black smoke that was continually pouring out of the chimney and was quite a nuisance to the whole neighborhood. I soon began to try experiments to see if there was not some way to burn that smoke while under the boilers. First I found that the cold air drafts were altogether too large; when the ash pit doors were open there would be a continuous stream of smoke; open a fire door and there would be an increase of smoke.

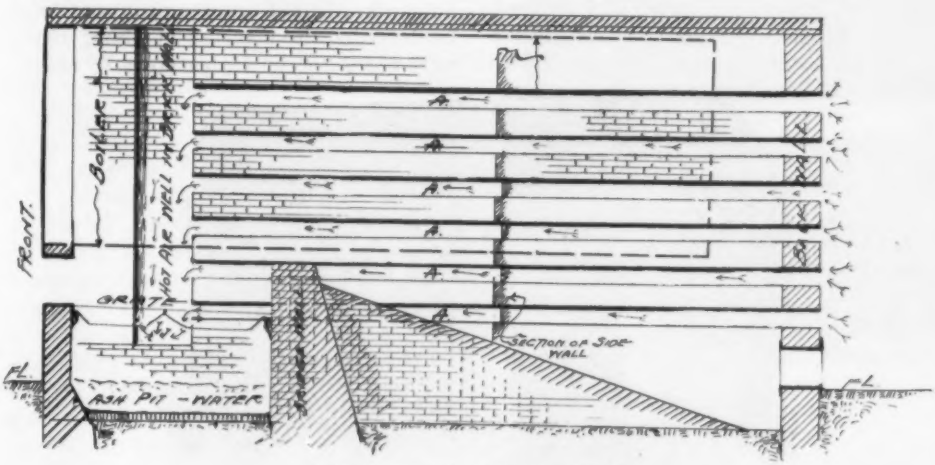
The boilers then in use were 4 feet in diameter with 18 feet tubes; I found that by closing the ashpit doors, leaving about 72 inches for draft, there was much less smoke. Then I found that by using air heated to 300 deg., 72 inches was enough for a 4 feet boiler or what was then called a 50 H. P. boiler. This hot air was let in under the grate bars all the time the ashpit doors were kept closed and I found that amount of hot air was plenty enough and when the doors were kept closed no smoke went up the chimney. The hot air was let in from the side walls of the ashpit. We built the bridge wall with an opening from the ashpit to the top of the bridge wall so that the hot air could come in contact with the fire as it passed over the wall and in that way burned what smoke there was. The chamber back of the bridge wall was full of a continuous white heat which was not the case when the ashpit doors were open and cold air for draft.

If hot air is used it takes but a small quantity while cold air cools off the gas and it

passes off in smoke. I will try to explain how I procured the hot air draft. If the arrangement is made while the brick work for the boiler setting is being put in it can be done with very little expense and will show quite a saving of coal.

When putting in the brick work for the boilers I commenced by making a well hole in the side walls which entered the ashpit about half way from the underside of the grate bars to the bottom of the pit, as shown in the illustration. This well hole was about 6 by 8 inches and extended to the top of the side wall. There were air passages running through to the end of the wall at back end of the boiler; the lower one was made about on a level with grate bar and the space was the thickness of a brick and about 2 1/2 inches wide. These were covered by one course of brick, then came another air space. These were carried up to about where the brickwork came in contact with the boiler sides, the spaces being left open at the back end of the wall to allow the air to pass through to the well hole. From there it entered the ashpits and was quite sufficient to supply a hot air draft so as to burn all tne smoke from the fires, the ashpit doors always remaining closed.

This was the way that I took to furnish the hot air for my fire drafts. Air heated in any other way would do, but this was the most economical way that I could find to do it. In setting my boilers I always made the ashpits about 14 inches lower than the boiler room floor, had them made water tight and kept them well filled with water; this prevented the ash dust from flying all over the room when cleaning out the ashpits and the continual dropping of coal and ash from the fires into the water caused a steam to arise, and this gave a much brighter look to the top of the fires and the grate bars would last more than twice as long as those used without water in the pits.



BURNING SOFT COAL WITHOUT SMOKE.

DRYING COTTON CLOTH BY EXHAUST STEAM.

BY WESLEY BARTINE.

The application of exhaust steam to the drying of cotton cloth in place of live steam, as used at the present time, is practically in its infancy and the large saving by this means of drying over the old is demonstrated by the plant of S. Lea & Sons of Philadelphia, Pa., as it was here that the old style of drying was used for years.

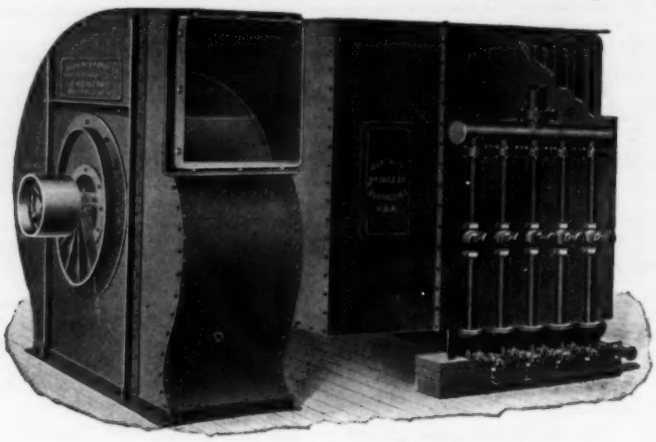
This plant is located at American St. below Girard Ave. The principal business is the finishing of cotton goods and for this work four tentering machines, manufactured by the H. W. Butterworth & Sons Company, of Philadelphia, have been installed. These machines are made to accommodate cloth from 27 to 42 inches wide, and are so constructed that when the pieces are fastened in position it makes the top and bottom of a large box, the width of which is the width of

the cloth, 24 inches high and 60 feet long. On the inside of this box at the upper and lower corners of the sides is the traveling chain upon which the cloth is fastened, and which holds it down close to the sides, practically making an air-tight box, size as given above.

The cloth is starched and stretched and run over hot rollers; it is then started through the tentering machines. It is fed in the machine at one end and taken away at the same end thoroughly dried and finished. By means of galvanized iron piping the hot air from the hot blast apparatus is let into the box from the side, and when the cloth is stretched across the top and bottom of this box and apparatus is working, it travels 120 feet and the hot air having no other means of escaping, is compelled to follow its way through the cloth and carry with it the moisture. Previous to the change, each tentering machine was supplied with a separate apparatus which consisted of two 45-inch and two 60-inch steel plate blowers, running at 1,200 and 900 revolutions per minute respectively, with two 10 section 2 rows, and two 8 section 2 row heaters. The heaters require two 2-inch pipes with valves wide open when taking steam at 80 to 90 lbs. To supply this steam a 150 horse power boiler would not be any too large, and when considering the enormous speed, at least 55 horse power was consumed in running the same.

In determining the basis and size of apparatus which could be used to take the place of the old arrangement, it was necessary to obtain the amount of moisture to be absorbed. In weighing the cloth at different stages of the finishing process there was found a difference of 13 lbs., which represented the amount of moisture in the cloth which would pass through the four machines every minute.

Particular attention was paid to the temperature of the inflowing air, and by test, the air, under the old arrangement, was found to be entering the machine at about 180 deg., after reducing the temperature to about 120 deg., it was found that the material dried as well as with the higher temperature. It was also found that the material would dry as well when the delivery of air had a velocity equivalent to about 1 1/2 oz., which was about 50 per cent. less than the velocity in the old apparatus. Thirteen pounds of water is equivalent to 91,000 grains. Under ordinary conditions moving air coming in contact with moisture laden atmosphere will absorb the same in the proportion of 1 to 4, but as this air must pass through the cloth, it could not absorb the moisture as readily as in the open. Making an allowance of 50 per cent. for this would give 46,000 cu. ft. of air required per minute at 1 1/2 oz. pressure. There were a few rooms which it was desired to heat with the same apparatus, requiring 8,000 cu. ft. of air per minute, making a total of 54,000.



HEATING AND DRYING SYSTEM, BUFFALO FORGE CO.

As 120 deg. was required at the machine and twenty-four rows of heater coils, under ordinary conditions with exhaust steam, will give 120 to 130 deg., it was considered advisable to make allowance for the loss due to conveyance in the pipes. This allowance was made by the use of extra heater section, making 26 rows of pipe or thirteen sections of 7 by 8 ft. 10 Buffalo Forge Co.'s heater. This apparatus was placed in the basement and all four machines are on the third floor. The fan is belt driven and the heater is of the draw through pattern.

By using this apparatus 20 actual horse power was saved over and above that used for running the four individual apparatus, and as there was an abundance of exhaust steam, 150 boiler horse power was saved per hour. When taking in the aggregate, we were saving from two to two and one-half tons of coal per day of ten hours' run. Other economies were effected such as the convenience of having the apparatus all in one place, the necessary saving in repairs, and the working of the complete apparatus under the direct control of the engineer, also the valuable floor space which was previously occupied by four pieces of apparatus on the second floor. By using a large fan and heater, we have been able to dry the same amount of cloth as previously dried and entirely by the use of the exhaust steam. When checking over the actual amount of air delivered by the former fans at the speed given, we find that they were giving 43,000 cubic feet. As we require 46,000 it will be seen we are perfectly safe in our calculations. The results also to be particularly noted are the necessary requirements, not only as to the temperature, but particularly as to the amount of air for drying materials of this nature. The heating and drying system was installed by the Buffalo Forge Co., Buffalo, N. Y., who also designed it.

FOREIGN DESIGNS IN WOOLENS AND WORSTEDS.

Illustrations of two cloths for men's wear are shown at Figs. 1 and 2 and are selected from the last issue of Le Moniteur des Echantillons, the foreign sample journal which is issued every two weeks and supplies samples of the latest European fabrics for men's and ladies' wear.

Fig. 1 shows a light weight fabric in which the light stripe is obtained with a cotton

FIG. 1.

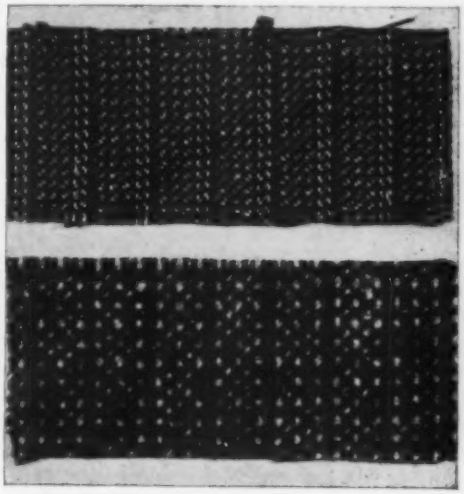


FIG. 2.

thread. The warp is dressed 3,255 ends, 61 inches wide in the loom, 54 picks per inch. Finished 6/4s.

Yarn: A, 2/56s worsted, dark; B, cotton, light color; C, 2-ply, 2/56s, 1 light, 1 dark; D, 2-ply, 2/56s, 1 dark, 1 medium.

Filling: 2/56s dark.

Warp Pattern: 2 threads A; 1 thread B; 1 thread C double; 1 thread A; 1 thread C double; 1 thread B; 1 thread A; 1 thread D double; (2 threads C double, 2 threads D double) triple.

At Fig. 2 is shown a stripe design in a light weight carded woolen fabric. The layout of this fabric is as follows: 1,938 ends, 66 9/10 inches wide in the loom, 32 picks per inch. Finished 6/4.

Yarn: A, 2 3/4 runs woolen, dark; B. 2-ply 5 1/2 runs woolen light; C, 2-ply 512 runs woolen, dark and light twisted together.

Filling: 2 3/4 runs woolen black.

Warp Pattern: 3 threads A; 1 thread B; (1 thread A, 1 thread C, 1 thread A, 1 thread B) double.

THE BOLETTE CONDENSER.

BY SAM DRIVER.

Carders usually experience some difficulties in running the Bolette condenser until they get familiar with its working. It is constructed very differently from the American condenser, yet does the same work.

The top and bottom roping can be regulated by the draft gears furnished for that purpose; sometimes the dividers get bent and do not make good roping (put in a new divider). If a ring on a doffer gets very badly jammed it must be replaced. On low stock the draft of web from comb should hang down forming a quarter or half circle between the dividers and comb; on long stock the web can be drawn much faster from the doffer.

Sometimes two strands will run together on this machine; in such a case, draw the divider and see that it is all clear, all straight and no dent. The fancy should be working to perfection for if it throws out stock or wind it will be very noticeable in the roping.

In starting the Bolette, first fill the finisher with stock, then break off the web about 12 inches from the comb, divide the web into five or six parts and slightly twist each one, of the webs softly in between the dividing blades, then start the finisher very slowly then draw the Bolette up and lay each part until the strands come through. If any of them get twisted in with the dividers, straighten with a small hook or the fingers, being careful not to get hold of the blades, start up slowly and put the strands in the usual place.

In low tender stock run the vibrating gear on end of the drum that drives the roping grinder at a slower speed than that for which the machine is adjusted. Use care at all times in changing from one quality to another; good judgment is called for in making these changes. Do not let any stock collect on the up and down receiving aprons; this can be avoided by setting the carrying rolls of the receiving apron so as not to press too hard. They must be set close to the top and bottom condensing aprons so that these aprons will clean them; these aprons should be kept clean and free from fibres.

If the roping is twitty or cut see that the dividing blade is well pressed down, then they will carry the web close to the condensing apron. This can be done by altering the lever arm that moves the dividing blades. Judgment must be used in altering anything on this machine. See that the blades move in and out and never allow them to stop. The Bolette is a somewhat complicated machine and needs wisdom and tact to run it.

COMBING SILK WASTE.

BY HENRI SILBERMANN.

There has been a two-fold object in improving silk combers: first, to prepare the staple with as little injury as possible; second,

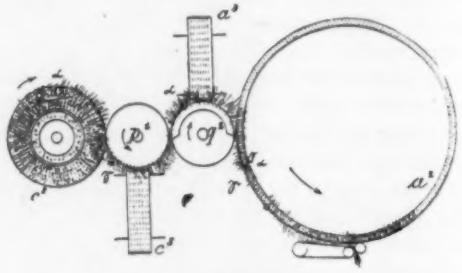


FIG. 35.

to separate the fibre according to the length; both of these are very important in the production of perfect florette yarn.

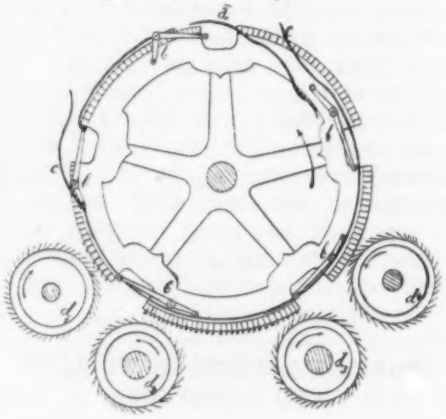


FIG. 36.

The dressing machine serves to sort the yarn according to the length as desired, although in other respects it is very incomplete.

The short fibres which are obtained at one process of dressing serve, as before explained, as raw material for the second dressing process, etc.

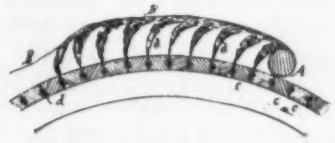


FIG. 37.

A special attachment of the Lister comb has been invented to dispense with the sorting of the fibres, and it does part of the work of the machine itself. Four circular clamps are adjusted to the surface of the combing ring. The first serves to hold the fibre while being combed; the second, to carry forward the combed stock a certain and previously determined distance; the third and fourth separate the filaments.

There are many other combers, which it is not necessary to describe because the general principles on which they are conducted are the same. For example, the two-head Lister-Warburton comb, Fig. 35, consists of a circular feed comb (c2); a circular tangent clamp (p2); a cylindrical comb (c3); a drawing-off combing ring (a2).

The Lister machine was used very early in England, to a less extent in France and quite generally in America. They are, however, always employed for short florette stock, but at present are but little employed in either England or France. The Hubner silk machine is a very good machine owing to its simplicity of construction and is similar to the cotton comber, differing only in the size and adjustment of the combs. The silk is combed twice whereas the cotton is combed but once.

The advantages of the old round comber, Fig. 36, for silk are recognized today by many; the objection to this machine being the necessity of operating the presses and clamps by hand. This work is done without stopping the cylinder which revolves only seven to ten turns per hour. The operator must fill the presses, turn the tuft of silk, remove the combed silk and also clamp the presses by hand.

In the Brenier and Neyret machine the processes are closely automatic and the production is increased about thirty per cent. with a reduction of labor. The daily production amounts to about fifty pounds.

In the old types of round comb, Figs. 36, 37, 38, the clamps (cc) are divided into five groups on the circumference of a large cylinder. These clamps are pressed together to hold the silk by means of the cam rod (d). The silk enters and is removed from the machine at (a) Fig. 36. The cylinder makes from sixty to one hundred and ten revolutions per day according to the material that is worked. As it revolves the knee or hinge (b) is pressed down by the cam which causes the end of the plate to press against the clamps and thus hold them in place. The silk is then combed by four workers (d1-d4). After passing these workers the clamp and likewise the press is opened and after one or two revolutions of the cylinder the silk tufts are reversed and the opposite end combed. The removal of the silk is effected as follows:—After the clamp is opened by the raising of the knee (b) the roll (A) is laid across the cylinder and the

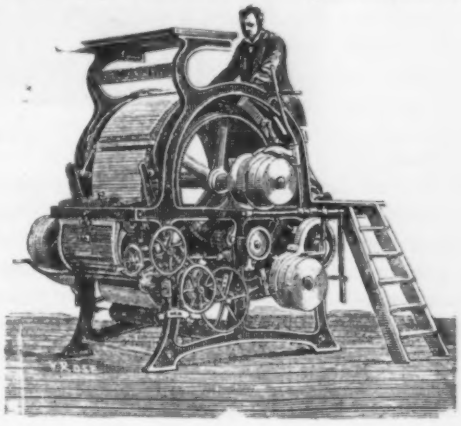


FIG. 38.

cloth (B) which is attached to the roll is then thrown over the silk and slowly wound on the roll, drawing the silk with it in the form of a fleece. The round comb was at one time very generally used, particularly for short fibres, while the dressing machine served for longer stock.

The new round comb of Brenier and Neyret, Fig. 39, is adapted for both long and

short florette silk. It is built with two workers, each twenty-five inches in diameter, in place of the four workers. The cylinder measures 65 inches in diameter, and is divided into five sections or presses, each of which is composed of a series of clamps for holding the silk tufts. The workers run from one hundred to a hundred and twenty turns per minute, but this speed can be varied as desired. The best conditions for an enlarged

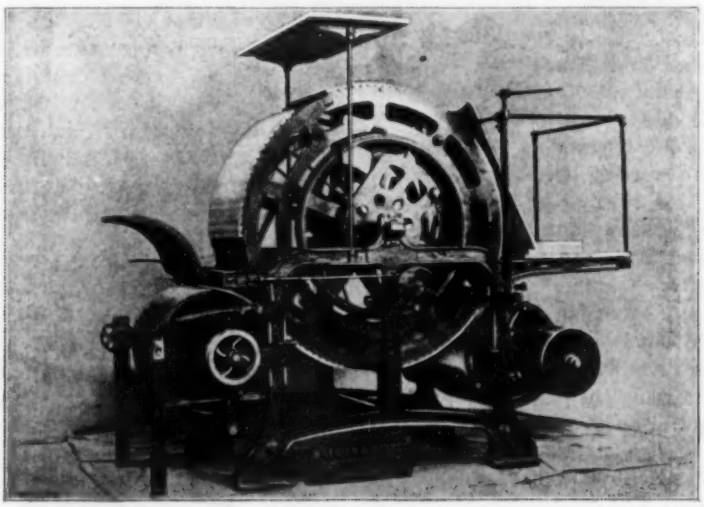


FIG. 39.

product are reached when the material itself has the largest and the workers the smallest practicable speed as by this means the stock is combed more thoroughly. The cylinder runs from sixty to one hundred and ten turns per working day, while the workers, as before stated, run about one hundred and twenty turns per minute. Before starting the machine care should be taken that the clamps in the presses are not too tight, which is likely to occur when they are carrying an unusually heavy load of silk; facilities are provided for adjusting the pressure as required. The production depends largely upon the quality of the material, varying from twenty to eighty pounds in twelve hours.

A device is built by Priestly for dispensing with the laborious operation of changing the silk by hand.

The combed stock is drawn from the Lister machine by fluted rolls then passed to a leather or cloth apron from which it is carried through a torsion tube which puts it in the form of a sliver. During these operations the silk is very likely to break apart, causing much loss of time. The device shown at Fig. 40 is intended to remove this difficulty. The position of the comb circle (A) and fluted rolls (B) and the ring (C) are as usual. From the apron instead of passing through the torsion tube the silk is carried through a pair of horizontal rollers (G) which press the silk together. It then passes through a set of upright rolls (H) and then again through a pair of cylindrical rollers (J), and from these it is taken by the drawing-off rolls (L). Close behind the rolls (G) a blast of air is generated which blows the fleece together just before it passes through the vertical rolls. By this device the fibre is removed from the apron without difficulty and the gradual compression of the sliver by the different rolls makes twisting unnecessary and the breaking of the sliver practically impossible.

Frequently the combed stock is "specked" before passing to the subsequent processes. This operation of "specking" is very hard on the eyes of the operator, who sits in a dark room and inspects the silk which is passed between her eyes and a brightly lighted window. Any specks arising from imperfectly combed silk or other material are thus easily seen and removed.

Figure 41 shows a machine built on the

principle of the fulling machine and is used for preparing silk noils for subsequent manipulation. The construction is much simpler than that of the regular fulling machine and the winding of the fleece on the feed roll is unnecessary.

MEETING OF NEW ENGLAND COTTON MANUFACTURERS, APRIL 22 and 23.

In the call for the above named meeting Secretary C. J. H. Woodbury gives notice of a proposed amendment to the Constitution and By-Laws to be voted upon changing the name of the association to the American Cotton Manufacturers' Association.

At the coming meeting the sessions will be held in Chipman Hall, in Tremont Temple, No. 88 Tremont Street, Boston, a short distance south of School Street, and opposite the Tremont Building. The entrance is at No. 88 Tremont Street, and Chipman Hall is on the sixth floor, reached by elevators.

The sessions will be called to order on Wednesday at 11 A. M., and 2 P. M., and on Thursday at 10 A. M., and 2 P. M.

It is expected that His Honor, Gen. Curtis Guild, Jr., Lieutenant Governor of the Commonwealth of Massachusetts, will greet the members with a welcome at the opening session.

The Board of Government especially hope that at this meeting the various papers will receive a full discussion and that inability to attend the meeting may not be considered by any one an impediment, as discussions may be written and sent to the Secretary to be read. For the purpose of furnishing better facilities for a discussion, the papers are to be printed in advance, if the manuscripts are received in time by the Secretary, and copies of such papers will be sent on request to any member five days before the meeting.

The full program will not be issued until the meeting, but papers are expected on the following subjects:

An English Textile School, Committee on Fire Tests of Cotton Bales, Continued Development of the Northrop Loom, Current Theories of Dyeing, Smoke and the Determination of its Density, Gray Goods for White Lawn Work, Improved Ginning Methods, Improving the Cotton Fibre, Local Transportation in Mill Economics, Louisiana Purchase Exposition, Regulation of Water Wheels, Supply of Cotton for Fine Spinning, Steam Trap, Stop Motions for Engines, Textile Education, Use of Reheaters in Compound Engines, and other papers of which the exact titles have not been received.

The program outlined above gives promise of a very interesting and profitable meeting and will doubtless attract a large attendance.

ENGLISH NOTES.

(From our Special Correspondent.)

Bradford opinion is growing resigned to the sad fate of the Yorkshire Woolcombers' Association. Unless a miracle happens the whole property must fall into lawyer's hands —lock, stock and barrel. The last ghost of a chance of reconstruction seems to have faded out of sight. There is no cohesion among vendors or shareholders. Writs are out alleging the complicity of directors in issuing a false prospectus; dissatisfaction is the sole point of unanimity among all parties. A complicating circumstance lies in the agreements which forbid vendors to engage in competition with the combine for twenty years to come. Liquidation will presumably dissolve these contracts and the wreckers will have a chance to buy back cheaply the plants that were sold so unwarrantably dearly.

All of the heavy woolen districts of Yorkshire are enjoying greater prosperity than for many years past. In the art of making pleasing fabrics from most unpromising material the Colne Valley firms are unrivaled. A fair proportion of their output is now being sold to Canada.

There is a disposition to be bullish over Canadian trade and prospects. More travelers have left for that country than ever before; not a large house in Bradford has failed to pay Canada the compliment of offering to do business there during the coming season. This attitude contrasts sharply with that of a few years back when Canadian orders unaccompanied by remittances were steadfastly ignored.

Dyers of piece goods are working at high pressure while yarn or slubbing people are

short of work. Carpets are in consistently good demand. In no other textile branch does the supply fall short of the demand so regularly. Messrs. T. F. Firth & Sons, Ltd., who have a leg upon each shore of the Atlantic, report a record year.

Spinners of spun silk who are located principally in the Brighouse district, are in their not unusual dilemma. Supplies of waste are short and dear and prices for yarns are low. The sewing and machine twists which form an item in our exports toward America, are less subject to the hungry competition upon orders between 25's and 60's counts.

AN EMBROIDERING MACHINE.

The U. S. Consul at Glauchau, Germany, gives the following description of a German embroidering device to be attached to the ordinary or power loom, Jacquard or other—by which it is said to be possible to embroider almost any design on the surface while weaving the cloth:

"It consists of two sets of needles or thread carriers attached to a longitudinal moving rack, which is fitted to the uprights of the batten, immediately in front and just above the reeds of the loom, and is counterweighted in such a manner that it rises and descends by means of cards operated from the jacquard cards.

"The embroidery yarn or thread for the needle is supplied from an auxiliary beam attached to the upper part of the loom frame between the harness and the batten, on which yarns can be wound direct or spooled yarns used if desired.

"When the rack is lowered, the needles pass down in front of the reeds, carrying the embroidery threads into and between the threads of the warp, where they are held while the bobbin, carrying the weft thread, passes through and under the warp shed, but over the embroidery threads, thus weaving the same into the goods, while the swing of the batten drives the weft and embroidery threads into the previously woven part. The rack when released rises to its normal position, where it is held until again brought into play.

"Palls attached to levers rotate the small toothed wheels that are geared into rack, thus driving the needle bar right or left. The spacing and the distance the needles carry in either direction are regulated by the jacquard card or operator.

"The two bars to which the needles are fixed oscillate in either direction, in harmony or otherwise, thus making it possible to embroider borders or designs on each edge of the goods at the same time. The needles being movable, the distance between the threads can be governed at will, and they are so arranged that there is scarcely any limit as to the size of yarns they will carry, thus making the use of the finest silks or of the coarsest knotted yarns possible. In making designs with this apparatus on heavy, double (or two-faced) cloth, no sign of the embroidery is visible on the under side.

"By the courtesy of a local manufacturer, I had an opportunity of seeing the apparatus in use, and was agreeably surprised at the simplicity with which it can be applied to any loom and the speed and faultlessness of its work. The mechanical principles of its construction are so simple that I can readily believe what the operator said—that it was easily managed."

The first mention of worsted yarn that occurs in English official records belongs to the eighth year of Edward II. (1315), which testifies to a complaint being made to Parliament that the clothiers of Norwich who manufactured worsteds were making pieces twenty-five yards long only and selling them as thirty, the regulation length.

It is inferred from the mention of a pair of stockings made of, say, a kind of worsted, and valued at the then large sum of three shillings, as being included in the wardrobe of William Rufus, that the distinction between woolen and worsted had been well established during the reign of that monarch.

It is related that Queen Philippa's crown was redeemed from pawn at Cologne, in 1342, by the king sending a sufficient quantity of wool over to produce the required sum, £2,500, the price at which it sold being 1s. 3 1/2d. per pound.

Questions and Answers.

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD RECORD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

For reply to questions that are not of general interest to readers of textile journals, such as those relating to the composition of yarns, analysis of fabrics, etc., we will charge the enquirer with the cost of the investigation.

Machinery for a Worsted Yarn Mill.

Editor Textile World Record:

We are planning to build a small worsted yarn mill (Bradford system) adapted for yarn of medium size and quality, say, 2/32's to 2/36's, three-eighths and quarter blood. Please inform us what machines will be required to balance one set of drawing on such work.

South West (319).

A worsted yarn mill such as our correspondent has in mind would require worsted machinery as follows:

Preparatory and carding machinery: 2-bowl scouring machine, each 18 feet long; 2 60 by 50 single cylinder cards; 2 self feeds; 2 single gill boxes; 1 ball winder; 2 combs; 2 can finishing gills; 2 single ball finishing gills; 2 Noble combs.

Drawing and spinning machinery: 1 revolving ball creel for 15 balls; 1 double can gill box set over 4 1/2-inch fallers, pinned through, knock-off; 1 2-spindle gill set over 4 1/2-inch fallers, pinned through, knock-off, bobbins 14 by 9; 1 4-spindle drawing box, knock-off, iron or wood top rolls, bobbin 14 by 9, covered hard; 1 6-spindle weigh box, knock-off, iron or wood top roll, covered hard, bobbin 14 by 8; 1 8-spindle finisher, knock-off, iron or wood top rolls, covered hard, bobbin 12 by 7; 1 8-spindle finisher, knock-off, iron or wood top rolls, covered hard, bobbin 11 by 6; 16-spindle reducer, wood top rolls, covered hard, bobbin 9 by 5; 4 32-spindle dandies, wood top rolls, covered hard, bobbins 6 by 4; 6 160-spindle cap spinning frames, 3 1/2-inch pitch, patent steel tension pulleys for tape driving, steel caps, wood top rolls, covered hard; 3 160-cap trap twisters, patent trap motion, steel caps, 2 inches in diameter.

Working Warper Reeds.

Editor Textile World Record:

Please give me a rule for working the reeds of a warper.

Ballyhack. (321.)

The above question has been referred to Arthur Dyson who answers as follows:—

In reply to your correspondent's question on the above subject, I would state that there are two reeds on a warper, and therefore it will be somewhat of a guess as to which of them he means; and the only thing to do is to give a general idea of their working: On a warper made to carry 500 ends, the creels are divided and spread in proportion to the size of the warper or section beams. This makes the creel quite high, and it extends back a considerable distance so that the front point of the triangle made by the creel is in the centre of the warper, and the back creel bar is the one which holds the threads on the outside of the sheet of yarn.

Naturally, there is a large variation in the number of ends put on a section beam, and therefore if not otherwise attended to, this would mean a wider or narrower "sheet," which of course would not be correct, as the beams are all one size. When starting up a new warper, the employee would start to put in the threads in the back comb, one in a dent; commencing at the centre of the comb, and taking the threads from one side of the creel. After both sides of the creel have been placed, the wheel on the end of the comb is turned in or out, thus expanding or contracting the spread of the comb, and making the "sheet" of the required width of spread. The threads are then placed in the drop wires, and from there go into the front comb, being placed as in the back comb, and spread to the exact position occupied by the section beam. Should the threads be a short distance from one side of the section beam, and by expanding the comb would be rubbing on the edge on the other side, the comb frame is moved over a little, thus giving the required placing on the sheet of yarn.

It is needless to state that the threads should be placed true with the beam flange, or there will be trouble at the slasher, as there will be one side which will be a little larger in diameter than the other, and thus take up more yarn, and when being placed on the loom beams on the slasher, the threads will run on "slack" and cause trouble in the weave room.

The combs should be kept in good order, otherwise two or more threads will be quite close together, and cause a ridge in the yarn or the beam, which the press roll will have to press down, and thus cause the yarn to run off somewhat uneven.

Calculating Change Gears on Lowell and Cohoes Slashers.

Editor Textile World Record:

Please explain the method of calculating the change gear on Lowell and Cohoes slashers for a

cut of given length, also the length of cut obtained with a change gear of a given size?

Potsdam (318.)

The accompanying diagram shows the arrangement of gears as follows:—

The bell gear has 50 teeth, driven by single worm gear on the pinion gear shaft. The pinion gear is driven by a change gear on the shaft of the delivery roll which is 18 inches in circumference, the size of the intermediate between change and pinion. A cut is marked at each revolution of the bell gear. As this gear, which has 50 teeth, is moved one tooth at each revolution of the pinion gear, it follows that the pinion gear must revolve 50 times per cut of warp. The drum, which is 18 inches in circumference, delivers 1/2 yard (18 inches) of warp at each revolution. Assuming that the change gear on this drum shaft has but one tooth while the pinion gear has 80 teeth, it will be necessary for the drum to revolve 80 × 50, or 4,000 times to turn the bell gear once and mark one cut. As 1/2 yard of warp is delivered at each of these 4,000 turns the cut obtained with a 1-tooth change gear would be 2,000 yards long. As the change gear is enlarged the bell gear is driven faster and the cut made correspondingly shorter; with a 10-tooth change gear the length of the cut would be 1/10th of 2,000 or 200 yards. Thus to find the length of the cut with an 80 pinion gear, 2,000 yards is divided by the change gear.

It follows from this that the change gear is found by dividing 2,000 by the yards per cut. Example: Find the change gear required on a Lowell slasher to give an 80 yard cut. 2,000 ÷ 80 = 25, teeth in gear.

If the pinion gear has, say, 105 instead of 80 teeth, it will take 5,250 revolutions of the delivery roll with a 1-tooth change gear to give one cut. This would make the cut 2,625 yards long with a 1-tooth change gear and 105-tooth pinion gear, and to calculate the length of the cut or size of change gear, 2,625 must be substituted for 2,000.

The accompanying diagram and formulas, taken from the catalogue of the Lowell Machine Shop, will serve to further illustrate the method of calculation.

The calculations for the Cohoes slashers are made in a similar way, the number 1,649.33 being used as a constant. For example:

1,649.33 ÷ number of teeth in change gear = number of yards in warp.

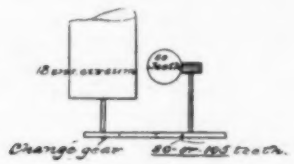
1,649.33 ÷ number of yards in warp = number of teeth in change gear. All of the regular Cohoes slashers are geared to give the same constant.

Manufacturing Cost of Cotton Warp Cassimeres.

Editor Textile World Record:

What is generally considered to be the manufacturing cost per yard of a cotton warp cassimere or melton? I mean the cost of labor, power, repairs, depreciation, taxes, interest, etc.

Pacific (320).



Rule to Find Cut Marker Gear.

$$\frac{1\times 50\times 80\times 18}{1\times 36}=\frac{72{,}000}{36}=2{,}000 \text{ Constant number.}$$

$$\frac{2{,}000}{\text{Change gear.}}=\text{Yards in cut.}$$

$$\frac{2{,}000}{\text{Yards in cut.}}=\text{Teeth in change gear.}$$

$$\frac{1\times 50\times 105\times 18}{1\times 36}=\frac{94{,}500}{36}=2{,}625 \text{ Constant number.}$$

$$\frac{2{,}625}{\text{Change gear.}}=\text{Yards in cut.}$$

$$\frac{2{,}625}{\text{Yards in cut.}}=\text{Teeth in change gear}$$

The manufacturing cost of cotton warp cassimeres, meltons or any other textile fabric depends in great measure upon the construction of the goods, such as size of yarn, threads per inch and weight per yard, etc. If full details of the lay-out are given the cost can be approximated, but the cost of the same fabric will vary widely in different mills, owing to the different conditions under which the goods are manufactured.

KNITTING DEPARTMENT.

For Knitting Mill Machinery, Equipment and Supplies, see pages 232 to 253. Also Buyers' Index.

THE KNIT GOODS SITUATION.

A generally quiet tone prevails throughout the entire knit underwear market, at least so far as orders are concerned, although the question of deliveries of summer weight underwear is causing the buyer a good deal of uneasiness and anxiety. Certain lines of light weight goods are much in demand, more particularly lines of men's combed Egyptian balbriggans, but diligent search and inquiry fail to locate any available supplies.

Not for many seasons have deliveries been so bad as during the present one and complaints are heard at all hands from selling agent as well as from buyer. It is very evident that a fairly large percentage of the goods sold for this season will never be delivered and the excuse which is given in almost every instance is the inability of the manufacturer to procure yarns.

It is well known that many manufacturers made but small provision for their yarn supplies at the beginning of the season, trusting that they could buy at more advantageous prices later on, but the result has been that prices throughout the entire cotton yarn market and more particularly on combed Egyptian yarns have risen to such an extent that the manufacturer does not know which way to turn and in some instances cannot get the required deliveries of yarns even at the advanced prices.

Some mills have been obliged to suspend operations temporarily owing to this yarn famine, as it is called, and scores of others although getting small deliveries are not securing sufficient supplies of yarn to keep their plants running on more than one-half to three-quarters time. It has been a severe lesson to the underwear manufacturer on the evils of "selling short," to use a Wall Street phrase, and it is expected that the experience will be productive of good results for the future.

On winter weight underwear, it is a long time since lines have been in a more satisfactory condition than at the present time. Not since 1893, 10 years ago, have such advantageous conditions prevailed and if manufacturers have failed to avail themselves of the situation, they have only themselves to blame. Original orders were more than usually large as the result of which duplicates have been very few and although such conditions are usually productive of cancellations, none of any consequence have yet been reported. Should present conditions continue, it is doubtful if cancellations of any serious amount will be received for the average

FIG. 1.

underwear buyer is evidently quite shrewd enough to realize that his early purchasers cannot be duplicated, but if for any reason a slump should come, then look out for cancellations thick and fast.

Lines of fleeced goods are in excellent shape and the manufacturer who is not sold up for the season is difficult to find. The only regret seems to be that higher prices were not secured at the opening, thus securing a larger and more reasonable margin of profit. Notwithstanding the present satisfactory condition of the market it is doubtful

if many of the heavy weight underwear manufacturers will be able to show a very large balance on the right side of the sheet at the end of the season; for, although prices have been advanced, these advances have not been so great as the condition of the raw materials market might safely warrant. Some talk is already being heard of preparations for spring of 1904 but in view of existing circumstances it is doubtful if active preparations will be commenced for some little time to come. Only a manufacturer who has a fair supply of yarn on hand for next season's requirements would be warranted in making quotations on lines for the coming spring and in view of the existing circumstances regarding deliveries of this season's orders it would seem as though they were practically all in the same boat and the manufacturer with a surplus supply of yarn might not be found in several days travel.

If lines for spring of 1904 will show as much improvement as did this season's lines over those of last season, some interesting developments may be looked for. Domestic manufacturers have been making great advances indeed along the line of knitting and the results have certainly been exceedingly gratifying and it gives us pleasure to present to our readers in the accompanying cuts some illustrations of the advances which have been made.

FIG. 2.

At Fig. 1, is shown a ladies' vest in a very effective fancy stitch pattern made from a fine lisle and mercerized fabric. This has been one of the best sellers in the line of Bateson & Dowd, selling agents for the Southdown Knitting Co., by whom this garment was made. This number is made in pink, blue and white, and selling to the jobbers at $3.25 net, it made an excellent fifty cent retail number.

Elaborate lace trimmings have been much in evidence and have been very successful sellers at all hands. At Fig. 2 is shown a very effective style of lace trimmed vests from the line of the Richelieu Knitting Co. It is trimmed with a lace insertion yoke and shoulder straps and was a ready seller at $1.90 net. The Amazon Knitting Co. make a vest from a cheaper grade of yarn but finished with a very effective wide lace trimming. The lace in one continuous length forming the yoke as well as the shoulder strap, is drawn together with a neat bow of ribbon at the top of the shoulder and extends down the back of the neck forming a yoke as in the front. This number is from the line of the Amazon Knitting Co. and has been one of the most successful numbers of the season at $1.00 net. At Fig. 3 is shown a vest in the popular crepe effect weave which has sold well at $1.15 net. This garment was made by J. W. North & Co. and is one of the best values in a crepe garment which has been shown this season. The Amazon Knitting Co. have been very successful with a line showing novelty stitch effects, it has been an excellent seller at $1.90 net. Only a season or two ago no such novelties as these could be found in the line of any of our domestic manufacturers, but the advances which are being made from season to season are almost marvelous.

The situation in the hosiery market is practically the same as in the underwear division except that deliveries are perhaps not quite so late, although even here there is considerable cause for complaint. Manufacturers are well sold up, prices are holding exceedingly firm and supplies of desirable goods are at low water mark. The action of the Southern

Association of Hosiery Manufacturers, who at a recent meeting held at Atlanta, Ga., agreed to advance their prices from five to fifteen cents per dozen, has been very severely criticised generally throughout the market. It is doubtful if such methods of gaining higher prices are very productive of the desired results and it is not expected that any uniform and concerted action will be taken notwithstanding the agreement so firmly entered into. It is very evident that certain lines can easily be sold at the advanced prices agreed upon, while with other lines of inferior merit it would be impossible to get the advance.

Lines of fine gauge lisle hosiery have been very successful and this class of goods is likely to share the popularity of lace effects

FIG. 3.

in ladies' goods. In men's half hose laces are not nearly so good as they were, but have been replaced to a great extent by neat small embroidered and jacquard patterns. Fine gauge lisle hose in neat self clockings are particularly good, with a decided preference for greys, modes, and wood tones. The new gun metal color, a jasper effect in men's half hose, is particularly good for the spring trade but little attention is being paid to it in lines of ladies' hose.

The Chemnitz market continues firm and maufacturers apparently have all the orders they can handle for some little time to come. Lace hose in ladies' goods are still being sold to a certain extent, but the demand is not to be compared with that of a year ago. Extracts continue to improve and small neat effects in black and white combinations are being freely bought.

TUCK STITCH.

In the March issue of the Textile World in the article entitled "Guide to Knitting" which appeared on page 20, there is a design of tuck stitch (Fig. 28) which the author has since learned is identical with a stitch shown in the figured fabric patented by E. A. Hirner, Pres. Excelsior Knitting Machine Co., April 29, 1902, patent 698,499.

He was unaware of this, or any other stitch would have been chosen to illustrate the tuck stitch.

THE KNITTING INDUSTRY IN CANADA.

BY AN OBSERVER.

The knitting industry in Canada at the present time is in a flourishing condition. This is owing partly to the very large wheat and corn crops of the past year throughout the North West, and partly through the influx of American farmers, crossing the borders from North Dakota and other portions of the States, into the wheat fields, thus increasing the population very materially in the Northwest of Canada.

It is generally conceded, that when the farmers of any country are prosperous, it gives an impetus to all manufacturing industries, and to this I attribute largely the cause of the present good condition of the knit goods trade in Canada.

The knitting trade in Canada is confined almost entirely to home consumption, the quantity of goods exported being very small. The whole population of Canada is only about six million, and the entire trade is therefore limited to that extent.

The greater part of the machinery in the knitting mills is of American make.

The majority of the knit goods manufacturers use up-to-date American methods in running their mills, except apparently they are not as enterprising as the American manufacturer, and this may be owing to the fact that not having but a limited outlet for their production, they are naturally held back in any large extension of their plants.

When they want skilled help they generally employ men who have had experience in the knitting mills in the U. S., although there is generally a feeling of dislike among the Canadian operatives toward a "Yankee" boss, as they term them.

The class of goods made compare favorably with those made in the States, both as regards quality and finish, and the prices obtained are slightly in advance of similar goods manufactured on the other side of the line.

In fleece-lined for example, in Canada the garment is identically the same as those made here, for which the American manufacturer gets $3.25 for a twelve pound shirt. In Canada they get $3.90 per dozen.

The cost of production in Canada is somewhat higher, as the prices paid for some of the operations in the finishing room are a trifle more.

The help, generally speaking, do not seem to have the ambition or "hustle" which is prevalent throughout mills here, with the result that while the Canadian girl in the mill gets a higher piece price for her work, she does not earn any more money than the American girl doing the same work at a less price per dozen.

Then again the production being limited as before stated, one girl does two or more operations on a garment, and therefore cannot become as efficient or do the work as rapidly as one can who does only one operation day after day, thus becoming rapid and expert on that one operation. Take for example an underwear mill turning out say, 700 dozen per day of shirts and drawers in the United States. One girl doing the one operation of stitching around the neck of a shirt becomes very expert and can do about 300 dozen per day on this single operation, for which she receives three-eighths of a cent per dozen.

There being no single mill in Canada producing this quantity of shirts and drawers per day, they have not sufficient work on this single operation to keep a girl steadily at work, therefore they have to combine two or more operations together and thus it costs more.

The help in general are well educated and intelligent and learn quickly and make good efficient help, and do their work well. They are fully as independent as those in American mills, and while some of them have no unions, yet the help will stand together and are practically master of the situation, because help, as a matter of course, is scarce, and they have been known to stand together and threaten to strike if a "Yankee" boss to whom they took a dislike was not discharged, and the manufacturer has been compelled to accede to their demands or shut down his mill.

They have a factory law and inspectors of factories the same as in the States, and the hours of labor are the same, viz., sixty hours per week. The payment of wages is usually every two weeks.

They use the coupon system for piece work the same as is used almost entirely in the knitting mills of the United States.

In the mills where cotton is used they buy American cotton from the south, and also Peruvian cotton; the latter mixes very well with fine wools, so much so, that it is very hard to detect the cotton.

They use Canadian pulled wools, and Australian wools for fine woolen knit goods.

For winter underwear some very heavy all wool shirts are made, weighing as high as seventeen pounds per dozen; these are for the North-west trade, where the thermometer ranges from forty to fifty below zero the greater part of the winter. Heavy all wool half hose are also made for this trade, some weighing as heavy as five pounds to the dozen.

Most of the knitting mills are located in the East, so-called, and they have to supply the whole of the trade in the North-west. A larger winter business is done than in the spring lines, owing to the fact that the summers are short, and therefore spring and light weight shirts and drawers and hose are

very little worn; in fact, I have seen quite a number of men wearing heavy woolen socks all summer.

The Canadians have a protective tariff on knit goods going into Canada which is sufficient to keep out the American goods. What goods the Canadians import come from England. Cotton and worsted yarn are also imported from England. They have a duty on all numbers of cotton yarns up to 40's, but numbers over 40's come in free. This provision of the tariff comes in very nicely for making Egyptian balbriggan underwear, as they can then use two threads of 40's, which makes a better balbriggan garment than one made of single 20's even if it is the same weight in the shirt.

The Canadians still keep to the old plan of goods being tied up in bundles of one-half dozen and dozens, both in underwear and also in hosiery, some of which are parceled, and some not, only a very small quantity of the goods being boxed.

DESIGNS FOR FANCY KNITTING.

F. W. HERINGTON.

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[These and the succeeding articles will treat of the designing of patterns for fancy knit goods and particularly the pattern known among knitters as the "tuck" presser work on spring needle circular machines, such as the "Tompkins," Campbell & Clute, Crane, etc.—Ed.]

The "design" is sketched on the same kind of design paper as used for weave drafts.

The space between two vertical lines and between two horizontal lines, which represents a square on the design paper, represents a single loop, Fig. 2 A and the "xx" Fig. 3 "B" represent two tuck stitches, where the thread crosses in a straight line at the back of two loops, Fig. 1 CD.

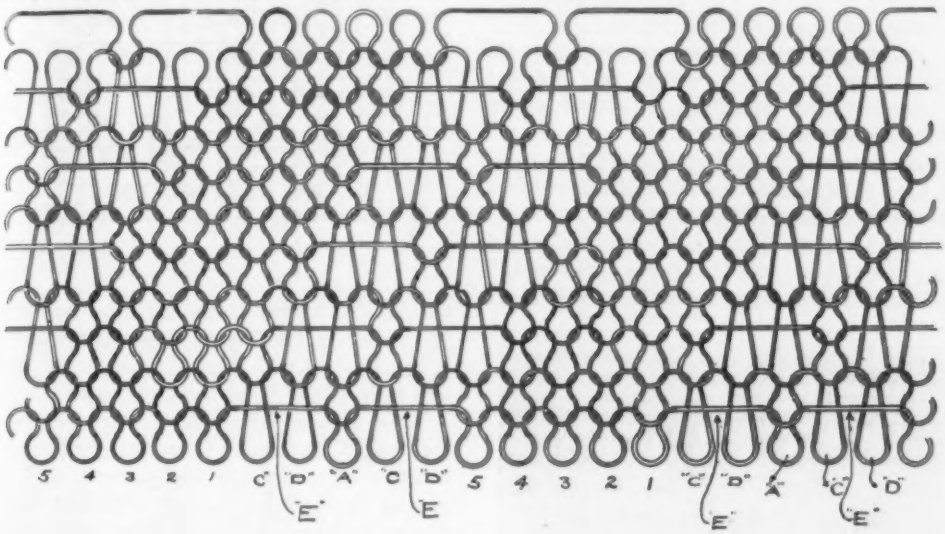


FIG. 1.

Figure 2 shows the knitted fabric. It can be made with two contrasting colors, or a third color can be used as in the sample of cloth here shown and which we find has a blue thread every tenth course, the other two are pink and white, alternately, except where the blue intervenes.

It can also be made with a single color; the "tuck" stitches will still show the design or pattern.

We take the sample of cloth and by unraveling it, find there are five plain stitches, one, two, three, four, five, Fig. 1, see also Fig. 3 E E. Then follow two tuck stitches, Fig. 1 CD and Fig. 3, B, then follows one plain stitch Fig 1 A and Fig. 3 G, then two tuck stitches Fig. 1 CD and Fig. 3 K, then we find the five plain stitches, etc., are repeated. The next course of loops we find are all

plain stitches, the next course is the same as the first course except that the tuck stitches are placed one needle or loop to the left of the corresponding tuck stitch of the first course.

We therefore begin at the right hand upper corner and count off five squares, Fig. 3 E E, which represent the five plain stitches, then the next two squares marked X represent two tuck stitches; then we count one plain stitch Fig. 3 G, then two more tuck stitches, which complete the pattern, Fig. 4 K.

On the next row Fig. 3, No. 2, there are no tuck stitches, all being plain.

Courses three, five and seven show the same stitches as No. 1, except that the tuck stitches are each one loop or square to the left of the preceding course.

This design is a very simple one as shown by Fig. 3 as it consists only of ten stitches, and the alternate courses are alike.

It can be made with two, four, six, eight, or more feeds, one feed with a plain needle presser, and the second with a tuck presser,

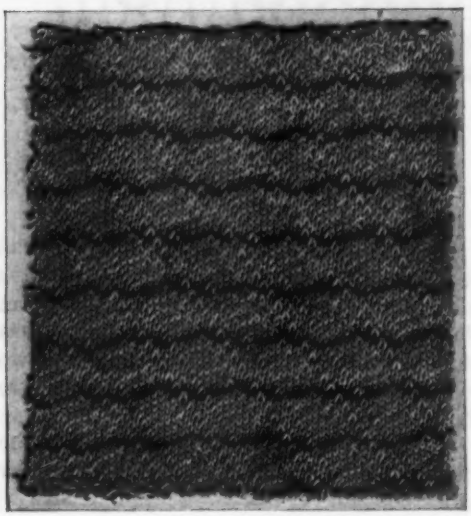


FIG. 2.

and so on for every two feeds, and each tuck presser will be cut the same.

In order to have this pattern run diagonally to the right or left, Fig. 3. all that is necessary is to have the number of needles in the cylinder divisible by 10 (which is the number of stitches the pattern consists of) with a remainder of one or of nine; for example, we will suppose the cylinder to have 999 or 1001 needles. At every revolution of the needle cylinder the tuck needle presser will be

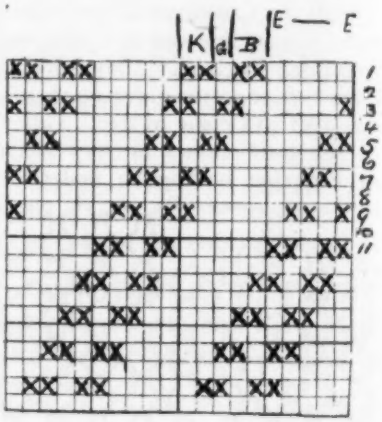


FIG. 3.

thrown one needle to the right, or one needle to the left, according as to whether there is a remainder of one, or of nine, and the pattern will remain the same in either case.

After having drawn the pattern on the design paper, and counted from right to left the number of stitches in the pattern, and after having ascertained that the cylinder has the proper number of needles, the next thing is to cut the tuck needle presser to correspond with the design.

Figure 4 is a plan and elevation of the tuck needle presser.

As the pattern consists of 10 stitches the number of teeth or cuts in the presser must be a multiple of ten; say, sixty, seventy, eighty, ninety or one hundred.

The small indentations or cuts, Fig. 4 B, represent the plain stitches of the pattern, Fig. 3 E E and G also Fig. 1, Nos. 1, 2, 3, 4, 5 and A; the deep slots, B2 Fig. 4, represent the tuck stitches, Fig. 3 B and K, and Fig. 1, C and D.

This section of the needle presser is repeated around the presser.

If more than 2 feeds are used on the machine to produce the pattern, that is, one plain presser feed and one tuck presser feed,

each tuck presser for this design will be cut the same, but they will require to be set one needle to the right or left of the preceding tuck presser, starting on a certain needle, from the starting point of the pattern Fig. 4, in order that the diagonal may be continued at each revolution of the needle cylinder.

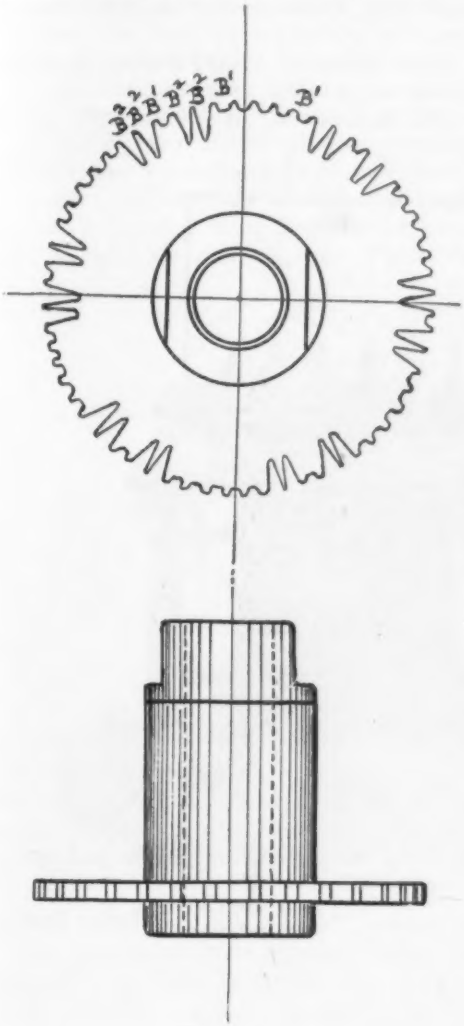


FIG. 4.

Referring again to the tuck presser, Fig. 4, the small indentations, B, representing the plain stitches are set in contact with the beards of the spring needles, this closing them and pressing off the stitch.

The deep slots Fig. 4 B2 do not come in contact with the beards of the needles, and are consequently not pressed off, but they remain on the needles together with the tuck stitches formed, these are pressed off together at the succeeding plain presser with the result that the tuck stitches (where there are two together) leave a loose thread, Fig. 1 E, at the back of the plain stitches.

It is therefore desirable in designing a pattern not to have more than three or four tuck stitches together as the length of the loose thread at the back is thereby increased.

If the number of the needles in the cylinder be an exact multiple of ten and the same tuck presser is used, the result will be a pattern or design like Fig. 5, and if only two colors are used, say a black and a white thread, the

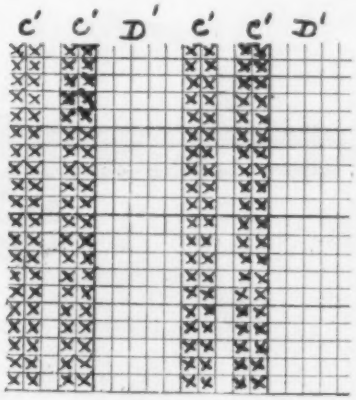


FIG. 5.

black one on the tuck presser feed and the white on the plain presser feed the two sets of loops at Fig. 7 C will produce two distinct vertical stripes in black, the white on the tuck being thrown to the back does not appear on the face or front of the knitting.

The plain stitches Fig. 5 D will show alternate rows of black and white.

FOREIGN TRADE IN KNIT GOODS.

The recently published official statistics of German exports in knit goods for 1900 show that this trade amounted to $23,343,360, divided into seven classes as follows:—

1. Cotton Knit Goods..$13,003,920
2. Cotton Gloves 3,558,240
3. Cotton Fish Netting. 169,440

4. Linen Hosiery	8,640
5. Silk Hosiery	791,040
6. Half Silk Hosiery ...	411,600
7. Woolen Hosiery	5,400,480
Total	$23,343,360

This large volume of merchandise was sent to all parts of the world and the following table shows the destination of the bulk of the goods; the numbers indicate the weight in units of 220 lbs.:—

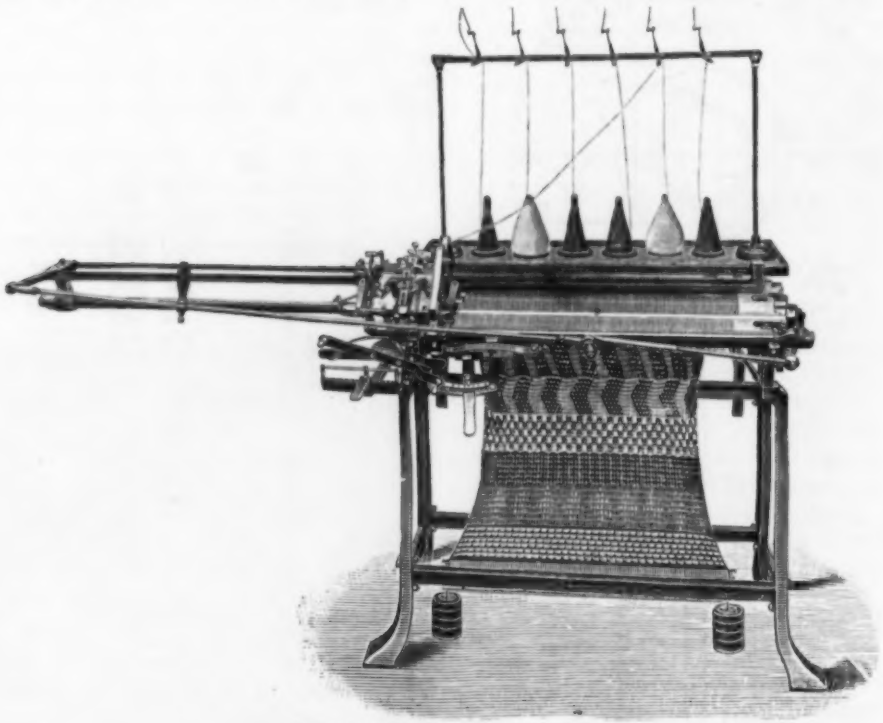
Cotton Knit Goods: Great Britain, 19,-114; Turkey, 3,051; Egypt, 1,545; South Africa, 754; British India, 5,127; Malacca, 1,279; China, 1,474; Philippines, 1,178; Argentine Republic, 1,778; Dutch East Indies, 241; Siam, 176; Bolivia, 171; Brazil, 2,680; British N. A., 1,120; British West Indies, 340; Chile, 2,405; Colombia, 304; Ecuador, 236; Guatemala, 155; Central America, 297; Mexico, 1,235; Peru, 1,073; Cuba, Porto Rico, 863; Uruguay, 1,503; Venezuela, 236; United States, 28,543; Australia, 4,113; Other Europe, 12,927; Other Countries, 3,593:—total, 97,511.

Cotton Gloves: Great Britain, 2,808; British N. A., 83; United States, 2,410; Australia, 156; Other Europe, 1,638; Other Countries, 318:—total, 7,413.

Cotton Fish Netting: Continental Europe, 565: Other Countries, 1,200:—total, 1,765.

Linen Hosiery: United States, 43; Other Countries, 5:—total, 48.

Silk Hosiery: Great Britain, 108; British N. A., 16; United States, 218; Other Europe, 5; Other Countries, 160:—total, 507.



KNITTING MACHINE FOR GOLF VESTS.

Half Silk Hosiery: Great Britain, 375; United States, 101; Other Countries, 210:—total, 686.

Woolen Hosiery: Great Britain, 10,843; Turkey, 1,053: Egypt, 213; South Africa, 465; British India, 390; Argentine Republic, 59; Brazil, 172; British N. A., 397; Chile, 149; Mexico, 496; Uruguay, 109; United States, 2,570; Australia, 472; Other Europe, 9,130; Other Countries, 1,610:—total, 28,128.

MACHINE FOR GOLF VESTS.

The accompanying illustration shows a Model K knitting machine which is giving excellent results in the manufacture of ladies' golf vests and blouses, men's fancy sweaters, etc. The American agent for this and other German knitting machines is E. H. Ludwig, Hawley, Pa., and he reports a rapidly increasing business in this line. The Model K machine will make patterns on either or both sides of the knit fabric. Beautiful effects are obtained by the use of silk for the fancy threads, the dotted patterns being especially attractive. A wide range of styles and fabrics can be knit, some being novelties for which this machine alone is adapted. The manufacturers who have installed these knitting machines find the goods very popular with the buyers, in many cases bringing an increased price by reason of the novelty of the design and elasticity of the fabric.

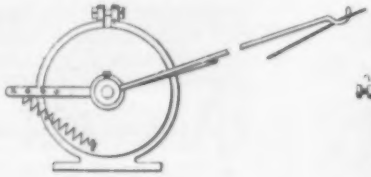


Fig. 1.

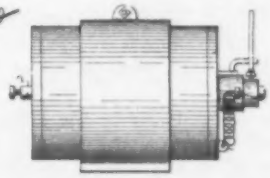


Fig. 3.

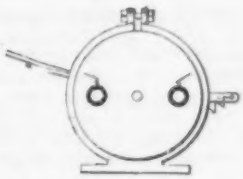


Fig. 2.

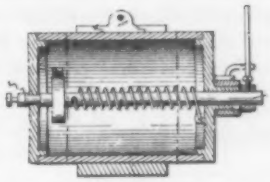


Fig. 4.

A NEW STOP MOTION.

The accompanying illustration shows a recently patented knitting machine stop motion. Figs. 1 and 2 are elevations of the two ends of the device. Fig. 3 shows the side, and Fig. 4 a longitudinal section.

The coils of an electromagnet are connected to the conductors, and a battery is also in circuit. The electromagnet is located to operate means for throwing off a belt to stop the machine.

When the hook is engaged by the thread or yarn, the arm engages the outer end of a curved arm, which is supported by a hub, mounted to rotate on a boss, formed centrally on the head of the cylinder. A spring is attached at one end to an arm, carried by the hub, and at the other end to a lug, formed on the head. The spring normally holds the arm in contact with a lug, which serves as a stop to limit the movement of this arm. A series of perforations in the arm enables the leverage to be adjusted. One arm forms a yielding stop for the other arm. While the arm normally engages the lug, the pull of the spring is so adjusted that when a knot or tangle in the yarn or thread catches the hook, this arm will overcome the tension of both springs and will lower the arm down until the yarn slips off the hook, thereby releasing the arm and permitting the cam to rotate and close a circuit through the magnet-coils and stop the machine, as above set forth.

In case of the breaking of the thread the arm would be immediately released, the circuit closed, and the machine stopped in the same manner as before.

The cylinder is made dust-proof. The inclosing of the circuit maker and breaker in a dust-proof cylinder is very important, since the lint and dust from the machine would otherwise soon render it inoperative.

Fitting Hosiery on Forms.

Editor Textile World Record:

We have just installed a dye plant and are dyeing our hosiery in the piece and finishing it in a

Cyclone dryer. We are experiencing considerable difficulty in putting our fine goods on the shapes. Do you know of any method of fixing the shapes so that the wet goods will slip on the boards easily? We are under the impression that there is something of the kind used.

Cape Cod (316).

Following is a reply by a practical man with a long experience in this line of work:

"If the shapes are finished smoothly and well and then well covered with a solution of melted beeswax to which a sufficient amount of turpentine has been added to make it the consistency of cream, this done after the boards are heated, there should be no trouble in boarding the goods. This process fills the pores of the wooden shapes and makes them impervious to water, and prevents swelling, shrinking and warping, and if put through this process once or twice there should be no trouble shaping goods on and off."

Another knit goods manufacturer writes as follows:

"I do not see why there should be any difficulty in putting the dyed goods on the shapes. We make some very fine goods and there is no trouble whatever. Two things might cause the trouble; one, that the goods are not run long enough in the extractor which leaves them too wet; the other may be in the knitting, that is to say, the stitch may be too short and so when they are dyed they are too hard and tight and do not slip readily on the boards. With us the fine goods go on easier than the coarser grades."

Another correspondent writes as follows:

"I cannot see why Cape Cod should have any trouble from the source referred to if the stockings are hydro-extracted and most of the water taken from the goods before boarding. Boarding can be done rapidly only by experienced operatives and it takes some little time to become proficient. A good boarder will take the stocking and draw it on the shape with one motion, then fix the heel and toe, when it is ready for the dryer. An expert can put 100 dozen and upwards on the boards in one day.

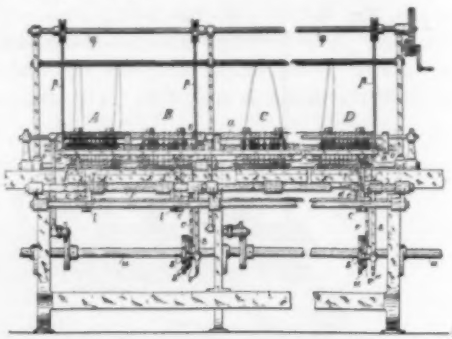
"There is no secret in shaping, but it takes some time to become an expert at it. I think the greatest trouble with Cape Cod is that he has not got experienced help either as foreman or operatives and I advise that he get such help from the hosiery centres until he gets well started. Shaping or boarding is a trade and men follow it all their lives. The wages earned vary from $1.50 to $2.00 a day and is paid by the piece or the dozen."

RECENT KNITTING PATENTS.

Knitting Machine. 723,037. Bruno Salzer and Gustav Walther, Chemnitz, Germany.

This invention relates to straight-bar-knitting machines, in which means are provided for removing the thread-guiding bar and guides from their working position when not in use.

The use of straight-bar-knitting machines for producing plain and pattern goods is connected with one disturbing circumstance—viz., the fact that the presence of the thread-guiding bar and guides in the machine when they are not in use are in the way. The observation of the plain-goods knitting and manual assistance which may become necessary are greatly interfered with.



The present invention consists in providing means to allow the complete removal of the thread-guiding bar and guides from mechanical connection with the machine and placing them in such an elevated position that they will be entirely beyond reach of the adjacent mechanism, so that the working process and the observation thereof can in no way be disturbed or interfered with.

THE FRENCH CIRCULAR FRAME.

In his work, Professor Willkomm says that he has not been able to ascertain with any certainty when the French circular machine was invented. He further remarks that "it must have been before 1840, as these frames were built soon after by Julius Borchardt in Chemnitz, and a Saxon patent was granted in 1841 to H. Beck, of Brussels, for a circular frame on Jouve's system."

Loop wheels were first used on English circular frames, and are therefore called in German "Einfuhr or Englische Mailleusen." The loop wheel itself was first invented in 1841 by a Frenchman named Jacquin, but it remains to the credit of G. Hilscher to have first introduced a large loop wheel, when

soon after a great many followed and claimed to be the inventors.

When Terrot started for himself he soon improved on the existing machinery (amongst other improvements being the using of better material than hitherto); and although he does not and cannot claim to be the inventor of the system, he improved it so much that he soon employed more men and turned out more machinery than all the other makers of this class of machinery put together.

It is only sixteen years since Messrs. Wildt and Co., of Leicester, introduced the Terrot machinery into England. In the autumn of the year 1886 they placed the first machine on this market, and it is running today. It is a notable fact that the mechanism of knitting machinery has made much greater progress during the last few years than has been made in contemporary weaving appliances, and, in fact, has probably made greater strides than any other class of textile machinery.

The high rate of speed, the accuracy of working, and the intricate nature of the process, make one feel that attainments are now reached which a very short time ago were considered impracticable. Amongst the patents granted in connection with the Terrot machine are those relating to plaiting regulator wheels, stop motion when a thread or when a needle breaks, and last, but not least, an automatic taking-up motion.

The cellular or open-work fabric, with its innumerable fancy designs and patterns, is very easily produced on the Terrot frame. This fabric, having eyelet holes or lacework designs, is produced by a somewhat novel method. In order to produce them, loops are removed from their needle and placed on the adjacent needle. In other machines this requires the loop to be shifted by a transferrer; but in this case the needle containing the loop to be moved is automatically shifted to a position immediately underneath the next adjacent needle, so that there are two needles, one above the other.

The loop on the upper needle, when subsequently moved along the stem of its needle, is also passed along the stem of the lower needle. On the pressing of the upper needle the half-loop is pressed off, leaving the needle empty, and the two loops on the lower needle thus make in the working of the following courses an eyelet hole at the empty needle.

The moving of the needle sideways, and the pressing-off of the half-loops, require special wheel mechanisms, which are cut according to the pattern required to be made. They are easy of adjustment, and an endless variety of patterns can be made.—Textile Recorder.

KNITTING MILL NEWS.

*Alabama, Greenville. J. F. Johnson advises us that a small knitting mill is in contemplation, but the matter is at yet entirely in embryo.

*Connecticut, New Britain. Operations have been resumed in the several departments of the New Britain Knitting Company's plant, connections with the new dye house having been completed.

Connecticut, Norfolk. A recent advice from the Norfolk and New Brunswick Hosiery Company (New Brunswick, N. J.), states that they are having a very large demand for their goods and have under consideration the matter of again opening the Norfolk plant. Nothing has yet been decided upon.

*Connecticut, Stratford. We have been advised by Henry Webb of the Webb Hosiery Co., that they have a few machines and started making samples of fine hosiery, but that they are not yet ready to make any statement.

*Connecticut, Winsted. The Winsted Hosiery Company, recently reported having increased the capital stock $50,000, will make extensive improvements and enlargements to the plant, including a new building, 100 by 53 feet, four stories, brick.

Georgia, Marietta. The Marietta Knitting Company will install 20 additional machines and a 100 h. p. engine (ordered).

Michigan, Grand Rapids. Plans are being drawn for the erection of a four story and basement brick addition to be made to the Globe Knitting Works. It is expected that work of construction will start about April 1st.

*New Hampshire, Nashua. The Granite State Knitting Co., G. R. Ruffle, proprietor, will start operations March 2d manufacturing mittens and gloves for men, women and children. Eleven knitting machines will be operated.

New York, Akin. A large addition is to be built to A. V. Morris & Sons' knitting mill. The capacity of the plant will be increased about four hundred dozen daily after the additional machinery has been installed.

New York, Brooklyn. The Morguntia Knitting Works is name of plant operated by Martin

Schnellbacher, at 850 De Kalb Ave. Toques, tam o' shanters, sweaters and other knit goods, of cotton, woolen and worsted are made.

New York, Greenwich. The Gordian Mesh Underwear Company of Matteawan, N. Y., has agreed to enter into a stock company with local parties and will remove the mill to this place. The capital stock of the corporation will be placed at $30,000. The brick mill at Middle Falls, has been secured and will be equipped with machinery, using electricity for power.

New York, Kinderhook. The Columbia Knitting Co.'s mill has been shut down for two weeks.

*New York, Oswego. Operations have been started by the Kendall Knitting Co., in the Conde Mills recently purchased. They will try manufacturing yarn at the Standard Yarn Co.'s mill, which if found unsuccessful will be converted into knitting mill.

*New York, Poughkeepsie. It is expected that the new addition for the Lindenwald Mills will be completed by May 1st. The present mill will then be used exclusively for manufacturing purposes and the new one for stock and shipping.

New York, Rochester. The Ideal Knitting Company has been incorporated with capital stock of $5,000, for manufacturing hosiery. The directors are Max Biswanger, Dennis P. and Kitte E. Cahill. This concern will probably operate the Ideal Knitting Mills, of which F. F. Robinson has been proprietor.

*New York, Stillwater. Henry Newland is president of the Saratoga Knitting Company, recently reported incorporated with capital stock of $200,000, to operate mill of R. & H. Newland and Newland & Dennison of Stillwater and Knickerbocker Mill of Mechanicville. E. H. Strang is vice-president; W. L. Howland, secretary and F. E. Howe, treasurer.

*New York, St. Johnsville. H. K. Salisbury's new mill is about ready to start operations.

New York, Syracuse. J. O. McMahon, 36 Everson Bldg., is getting names, prices, etc., of makers of hosiery machinery.

North Carolina, Burlington. The Burlington Hosiery Mills contemplate installing an up-to-date finishing and dyeing plant.

North Carolina, Enfield. Andrews & Whitaker, proprietors of the Enfield Knitting Mills, will install a dye plant in mill in the spring.

*North Carolina, Newton. The Valdese Hosiery Mill, recently reported purchased by D. J. Carpenter of this place, will be continued at Valdese, where additional machinery will be put in. Expects to make half hose and ladies' hose, all heavy weights.

*North Carolina, Shelby. Nothing has yet been done regarding rebuilding of the Lura Knitting Mills, burned last November. The stockholders have as yet come to no decision concerning disposition of the property.

*North Carolina, Winston-Salem. The Vaughn Knitting Mills, destroyed by fire last December, will not be rebuilt before next fall.

Pennsylvania, Bethlehem. Geo. D. Dobbins of So. Bethlehem, has leased a large brick building near corner of Scott and Elizabeth Avenues and will remodel same for manufacturing hosiery. Operations are expected to start early this month. About fifty girls will be employed at first.

*Pennsylvania, East Stroudsburg. A. W. Kistler & Bro., successors to the Pocono Hosiery Co., advise us that in addition to building a dye house, they will build an addition to the main mill and install considerable new machinery, about doubling the present capacity. They now operate 65 knitting machines on hosiery.

Pennsylvania, Hawley. Carl F. W. Ludwig, formerly superintendent of the Apolda Knitting Mill, at Honesdale, has started a small plant here, making fancy knit goods. Plant will be operated as the Hawley Falls Knitting Mill.

Pennsylvania, Lykens. Work has begun on the erection of an addition to Walter Duncan & Co.'s hosiery mill.

Pennsylvania, Mechanicsburg. The New Windsor Knitting Mills have been incorporated with capital stock of $100,000. Company makes half hose.

Pennsylvania, Mohn's Store. The Worley Hosiery Company is to build an addition to the mill.

Pennsylvania, Norristown. The Home Knitting Mills have been established here by Herman Preissler and Geo. W. Watt, with capital stock of $5,000. They manufacture cotton lisle half hose, with ten knitting machines, sold through William Iselin & Co., New York.

Pennsylvania, Philadelphia. The Chelton Hosiery Company has been incorporated with capital stock of $5,000.

Pennsylvania, Phoenixville. An addition is under construction to Thomas F. Byrne's underwear and hosiery mill.

Pennsylvania, Phoenixville. An addition is to be built to Parsons & Baker's underwear mill.

Pennsylvania, Pottstown. The plant operated by Fritz & Krause has been incorporated. Mr. Krause has withdrawn from the business, but Mr. Fritz will be identified with the new corporation. The new company proposes installing dye plant.

Pennsylvania, Reading. The Staple Knitting Knitting Company is a new concern which will soon start business at this place. Operations will be started up as soon as the machinery has been installed.

*Pennsylvania, Richland Station. Operations have been started up in the Richland Knitting Mill, manufacturing hosiery.

Rhode Island, Providence. The Vesta Knitting Mills are to erect a new five-story brick building,

corner Elm and Blount Streets, for manufacturing purposes.

*South Carolina, Landrum. The Blue Ridge Hosiery Mills have increased the capital stock as previously reported, and will install about 100 new machines.

Wisconsin, Portage. The Portage Hosiery Co. is building an addition, 75 by 65 feet, to the mill. They are also building a new boiler house.

In New York State.

Amsterdam, N. Y.—All the knitting mills here are very busy on summer weights. Inquiry develops the fact that a majority of the mills are behind on orders, and it looks as if later in the season there would be a big shortage in summer goods. Yarns are high and the manufacturers are running as close to shore as possible.

There were quiet rumors of a possible strike of the jack spinners unless their demand for an increase of 15 per cent. in wages is granted by that time. So far as can be learned the manufacturers have not signified their intentions in the matter. The jack spinners are not thoroughly organized in Amsterdam, that is, all the spinners are not members of the union. In some mills there are only a few union men.

Leopold L. Loevenheim and Carlton W. Zeyst of this city have recently purchased the old Myers & Parker broom factory building at Fultonville, and are getting it ready for knitting machinery and they purpose to conduct it as a knitting mill. The installation of machinery will be commenced early in April. Mr. Zeyst is now giving his attention to the preparations at the mill in Fultonville, while Mr. Loevenheim is in charge of the mill in Amsterdam, which was formerly conducted by Hull, Smith & Co. It has not been decided whether or not the firm will continue to conduct the Amsterdam mill.

Adam W. Kline of Amsterdam, traveling representative of Critten, Cliff & Co., knit goods selling agents at New York, has been very ill for several weeks at a New York hospital. He is on the road to recovery now and it is hoped by his family to be able to bring him to Amsterdam in a few days. He is the only son of Perry Kline of Amsterdam, who is an old knit goods manufacturer.

Samuel Lane, Harry and Clarence Wagner, Harvey Horning and Albert Peddie, of Fultonville, have recently taken positions with the Sovereign Knitting Company of Amsterdam.

The Breedon Needle factory of Amsterdam is so rushed with orders that the machinery is being operated until nine o'clock each night.

The Diana Knitting Mill at Johnstown, about two weeks ago booked an order for 260 cases of goods, amounting to 9,500 dozens.

A scarcity of help in the knitting mills in St. Johnsville is reported from that village.

George Sutliff, for eighteen years employed in the knitting mills of A. V. Morris & Sons, Amsterdam, left early in March for Scranton, Pa., where he is holding the position of foreman of the finishing room in the mills of the Lackawana Knitting Company. On the Saturday when he was leaving the Morris mills, the employees of the packing room, of which he had been foreman for many years, gathered around him, bade him farewell and presented him a handsome gold watch chain. The foreman of the mill presented him a purse of $25 in gold.

The Kendall Manufacturing Company who own knitting mills in Utica and other places have secured the Conde knitting mills at Oswego and they propose to enlarge the mill by adding another story. When the mills are again in operation it is said they will employ in the Conde mills four hundred hands. The same firm who more than a year ago purchased a button plant in Amsterdam, are, it is said, arranging to build a large mill for the manufacture of buttons in the western part of Amsterdam. It is proposed to make this one of the largest and most modernly equipped button factories in the east.

New York, Elmira. The Elmira Knitting Mills have placed a repeat order for humidifiers with the American Moistening Company.

PERSONALS.

Frank Tass is overseer of knitting at the Greenwich Knitting Co., Greenwich, N. Y. He was formerly of Amsterdam, N. Y.

Joseph F. Smith is J. A. Hendrickson's successor as president of the Salt Lake (Utah) Knitting Company.

Charles Robinson has been engaged by the Perry Knitting Co., Perry, N. Y., as night superintendent of their yarn mill.

Elmer A. Robinson is secretary of the Glastonbury Knitting Company, Glastonbury, Conn., succeeding the late Thomas J. Outtrim.

F. E. Parkinson, Franklin, Idaho, is manager of the Utah Knitting Works, Ogden, Utah.

Fred Naylor has resigned as dyer for J. Blood & Bro., Philadelphia, Pa., after having been with them for one year.

Minton Norton of Plainville, Conn., has gone to Norfolk, Va., to take a position as superintendent of a knitting mill there.

Lester D. Marsh of Woonsocket, R. I., has become general manager for the Glenark Knitting Co., Woonsocket.

Charles P. Linns, formerly knitter at Querns Bros.' Mill, Philadelphia, is the overseer of knitting at the Rainbow Knitting Mill, Germantown, Philadelphia, Pa.

Ernest C. Locke, for two years traveling salesman for the American Knitting Co., is now superintendent for the branch of the Vigilant Knitting Mills, Frankford, Pa.

George Cross, who for many years was a popular overseer in the card room at the Sulloway Mills, Franklin Falls, N. H., has resigned, and was presented with a gold watch.

E. Barnett is knitter for Parson & Baker at Phoenixville, Pa.

New Machinery and Processes.

This department is designed to present from month to month a brief mention of new machinery, devices, and processes being brought out in this country and abroad, that are of interest to textile manufacturers. It is not a list of patents, but of improvements coming on the market. The idea being to present to our readers a systematic monthly record of new machinery, etc., of interest to textile mill men.

We invite machine builders and others to send us such information for this department.

Full Automatic Hosiery Knitter. The Mayo Knitting Machine & Needle Company, of Franklin Falls, N. H., are putting on the market a new type of their Acme full automatic hosiery knitter, especially designed and perfected to produce lace effects of various character and styles. They have also perfected a new device for regulating the sizes of hose, which may be easily and quickly adjusted for different lengths. This device consists of a dial on which are indicated the different lengths and patterns as they are knit. By noting the setting of this dial, any former pattern can be again produced. A most valuable feature of this dial system is that a record can be made of any style of goods and at any time after the same goods may be reproduced exactly by setting the dial as per the numbers recorded. This dial feature will also be applied to all their special or regular plain machines. The factory which has recently been enlarged by two brick wings, gives them three times the floor space they formerly occupied. The popularity of the Acme knitter has so increased the demand that even with the recent large increase of floor space their facilities are still taxed to keep up with their orders and will be for some time to come.

New Style Watchman's Clock. The Newman Clock Co., Masonic Temple, Chicago, Ill., are putting on the market a clock, which was the invention of Mr. Newman, especially adapted for large plants. It is claimed that these watches cannot be tampered with. It is also claimed that better results can be obtained where all the watchmen in a plant go over the same route, instead of each man having his separate route and separate stations. This new watch is so constructed that each watchman can use any of the 64 stations and under this system some one goes to each station about every twenty minutes.

New Overseaming Machine. The American Overstitch Machine Co., 18 W. Randolph St., Chicago, Ill., who have been manufacturing glove and fur overseaming machines since 1892, are putting on the market a new overseaming machine adapted for knit fabrics, which is claimed to be particularly useful in the manufacture of sweaters. Among features claimed for the machine is that it makes a flat elastic seam, with two wool or cotton threads. The No. 7 B machine is used for sweaters, sewing and covering all seams and attaching sleeves, double rows of buttons, etc. The No. 17 machine is for sewing selvage edges of wool, cotton or light fabrics, knit gloves, fingers, thumbs, welting seam of the wrist without trimmer, also for blind stitching of hosiery, hemming, etc. It is claimed that wool, cotton or silk thread can be used without interfering with elasticity of the stitch.

Cotton Loom. George W. Stafford Company, Readville, Mass., are bringing out their "1902 Model" cotton loom. One feature to which particular attention is directed is that the height from the floor to the breast beam has been reduced, to make it more convenient of operation by women or small weavers Special attention has been paid to its convertible features. The loom has been constructed so as to receive fancy motions, such as dobbies, jacquards, box motion and various cam motions for special weaves. Automatic filling and changing mechanisms can also be readily attached, the idea being to enable the manufacturer to make a wide variety of goods with but slight additional expense. Simplicity and ease of operation are other points.

Ring Spinning Frame for Woolen Yarn. The Societe Anonyme Celestin Martin of Verviers, is placing on the market a ring spinning frame for wool which is described in another part of this issue.

Finish on Wool Goods. Hannart Freres, dyers, Roubaix, France, have adopted in their works a process invented by their superintendent which enables the well known zibeline effects to be obtained without fulling the goods. This is the firm that brought out some time ago the chameleon color on woolen dress goods, so-called because the shade appeared to undergo a continual change as the observer looked at it. We have a sample of the goods last named in this office which any one interested can see by calling here. The new process for the manufacture of zibeline is said to give very good results, and a brief description appears in another column.

New Departure in Mule Construction. John Hetherington and Sons, the well known builders of textile machinery at Manchester, England, for whom Stephen C. Lowe, 186 Congress St., Boston, is the sole American agent, have recently constructed a mule carriage in which wood is entirely dispensed with, metal only being used. The idea was suggested by the recent disastrous fire at Stockport, England, which was caused by friction in one of the spinning mules. It is said the new carriage is remarkably strong and rigid and makes its outward and inward runs as steadily and easily as the ordinary mule carriage.

Quick Traverse Winding Frame. Arundel & Co., of Stockport, England, have recently brought out a winding frame for winding yarn in the form of a cheese. The improvements are claimed to relate to a stop motion which, it is said, make it practically impossible for a broken end to get on the cheese. The speed of the drum can be adjusted to suit the different kinds of yarn and each side can be changed independently. Parallel or conical cheeses can be wound on the same machine.

Automatic Shuttle. W. R. B. Lockie, 17a South Castle St., Liverpool, England, is placing on the market an automatic device for changing shuttles during weaving. It is one of many similar attachments recently brought out in England.

Knit Goods Brushing Machine. Samuel Pegg & Son, Leicester, England, are offering to the trade a new type of brushing machine for knit goods. The improvements are in the arrangement of the gearing by which the brushing rollers travel faster and the goods slower than in previous machines. It is said to be specially adapted for such goods as Tam o'Shanters, caps, etc., which require a large amount of brushing.

Latch Needle Web Knitting Machine. Messrs. G. Blackburn & Son, Nottingham, England, are exhibiting a new circular latch needle web knitting machine which has a number of feeders and is fitted with an automatic stop motion. The newest feature is an automatic splicing tackle for splicing seats and knees.

New Calender for Silk Goods. Joseph Eck & Sohne, Dusseldorf, Germany, are builders of a new calender for silk goods which imparts a high lustre to the silk by reason of the minute corrugations numbering one hundred and twenty to six hundred per inch on the surface of the rollers.

Knit Goods Dyeing Machine. Samuel Pegg & Son, Leicester, England, are offering to the trade a new style of dyeing machine built on the open vat principle and specially designed to secure uniform shades on knit goods.

Velvet Brushing Machine. Messrs. Tomlinson, Ltd., Rochdale, Eng., are placing on the market a machine specially designed for brushing velvet fabrics. It has two revolving disks carrying on their faces a series of bristles or teeth. The brushes are fitted in sectional holders attached to the disks. Owing to the double contact a greatly increased production is obtained.

Moistening Machine for Hosiery. Samuel Pegg & Son, Leicester, England, have recently brought out a new machine for moistening hosiery, the adjustment of which, it is claimed is automatic. It is intended to prepare knit goods for the press and the principal feature is a device by which the amount of moisture applied to the goods is kept uniform.

THE HUNTER AUTOMATIC WOOL WASHER.

The accompanying illustrations show a new wool washing machine built by the James Hunter Machine Co., North Adams, Mass., the well known builders of textile machinery. The machine in question is the result of long experience on the part of the builders in the manufacture of wool washers and embodies all the improvements that their experience, investigation and experiments have proven to be desirable. It is adapted for scouring all grades of wool from the shortest Texas to the coarsest carpet stock. One very desirable feature is that the wool is submerged in the solution from the time of entering the bowl until it is delivered to the squeeze rolls. The exposure of the wool to the air while being pushed out of the liquor up a steep incline to the squeeze rolls is thus avoided. The liquor as it is squeezed from the stock by the rolls is pumped back to the feed end of the machine and delivered at this point with sufficient force to carry the wool along evenly to the rake as it comes from the apron of the preceding bowl.

Fig. 1 shows a perspective view of one bowl of the machine; Fig. 2 shows on a larger scale the delivery end. The massive construction and judicious and generous distribution of metal in all parts is at once apparent. The bearings for rolls, carrier, and rake mechanism are all of extreme size with a view of reducing the wear and consequent renewal of parts.

It will be noticed that the squeeze roll frames are carried forward at the top, thus bringing the centre line of the top roll ahead of the centre line of the bottom roll, permitting the carrier to work closer to the nip of the rolls, and thus insuring a more even feed. Straight frames are furnished if desired. The carrier is of few parts and of ample proportions to stand up to the work. It is operated by a crank with a positive gear drive on each end. The front end is carried on rollers, running upon a track and the whole nicely balanced. The carrier supplies an even, continuous feed to the squeeze rolls, from which it is delivered in a free, open and lofty condition.

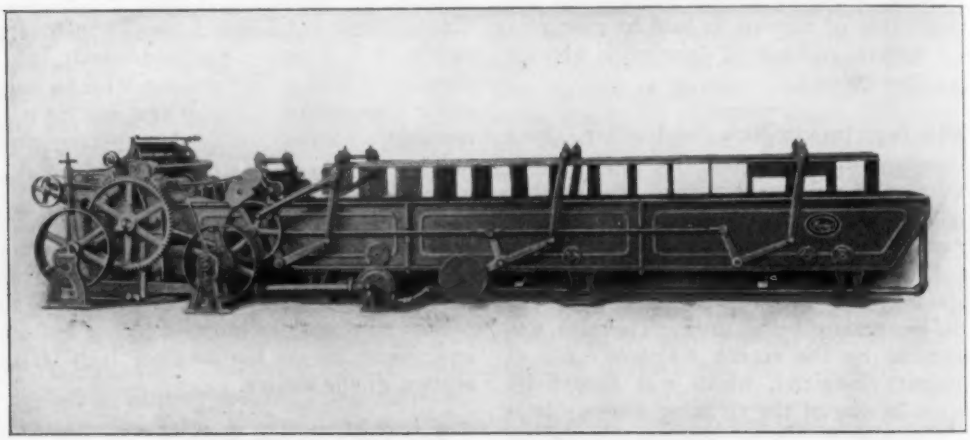


FIG. 1.

The improved parallel rake (patented) is an invention in which the James Hunter Machine Co. take especial pride, and they are confident it is the nearest to perfection of anything yet produced in this line. The users of it and all who have investigated its merits, give it unqualified praise. The rake is carried on vertical arms and actuated by means of a cam and connection arms through the medium of gears as shown. In operation it enters the liquor on the down stroke vertically, moving forward horizontally and parallel to the bottom of the bowl, lifting vertically at the end of stroke and returning hori-

zontally to the starting point. This is practically as well as theoretically what its name implies,—a parallel motion. Its operation is free from shock, jar or vibration and being perfectly balanced runs free and with little power.

The aim in building this machine has been to produce a wool washer simple in construction, easy to operate and of high efficiency, and the results obtained from practical tests prove that this aim has been accomplished.

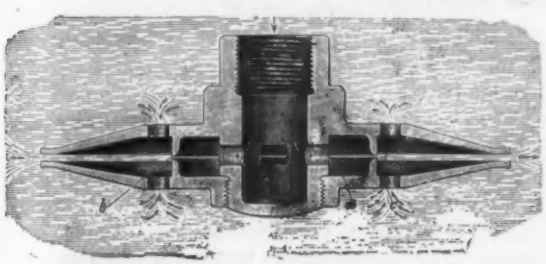


FIG. 1, WATER HEATER.

Many of these machines are now in operation in leading mills in the United States and the builders will be pleased to send their representative to consult with any interested parties.

WATER HEATING APPARATUS.

From the Deutsche Farber Zeitung we take the following description of a device for introducing steam into water for heating the latter:

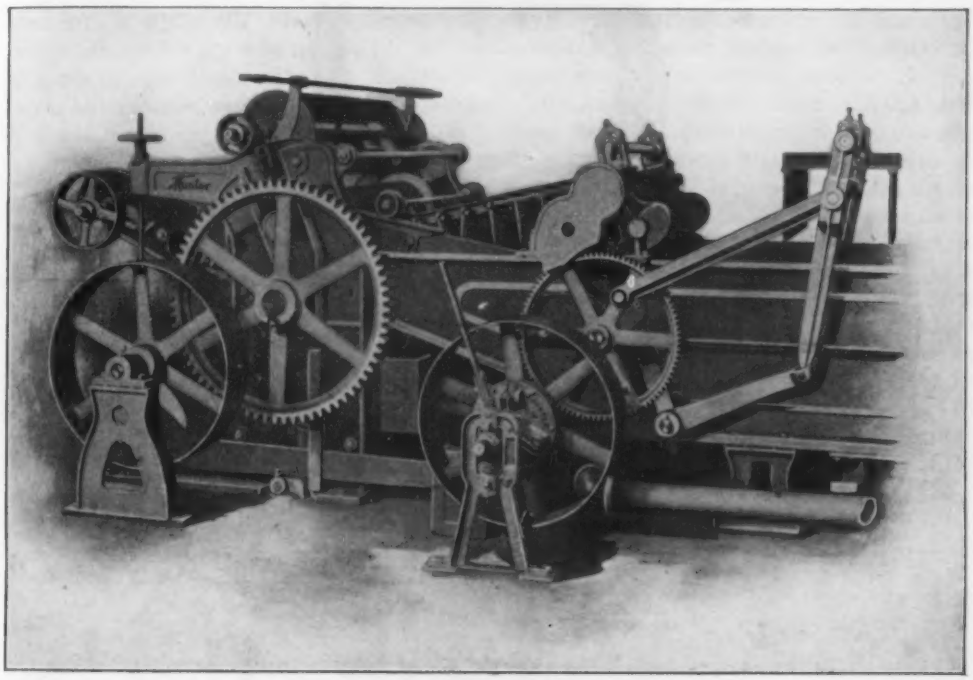


FIG. 2.

The methods heretofore used for distributing steam throughout water have been objectionable owing to the noise caused when the steam and the cold water came in con-

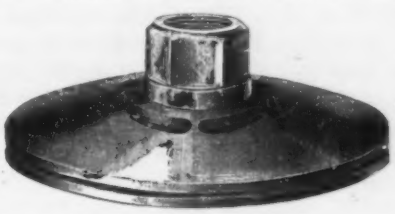


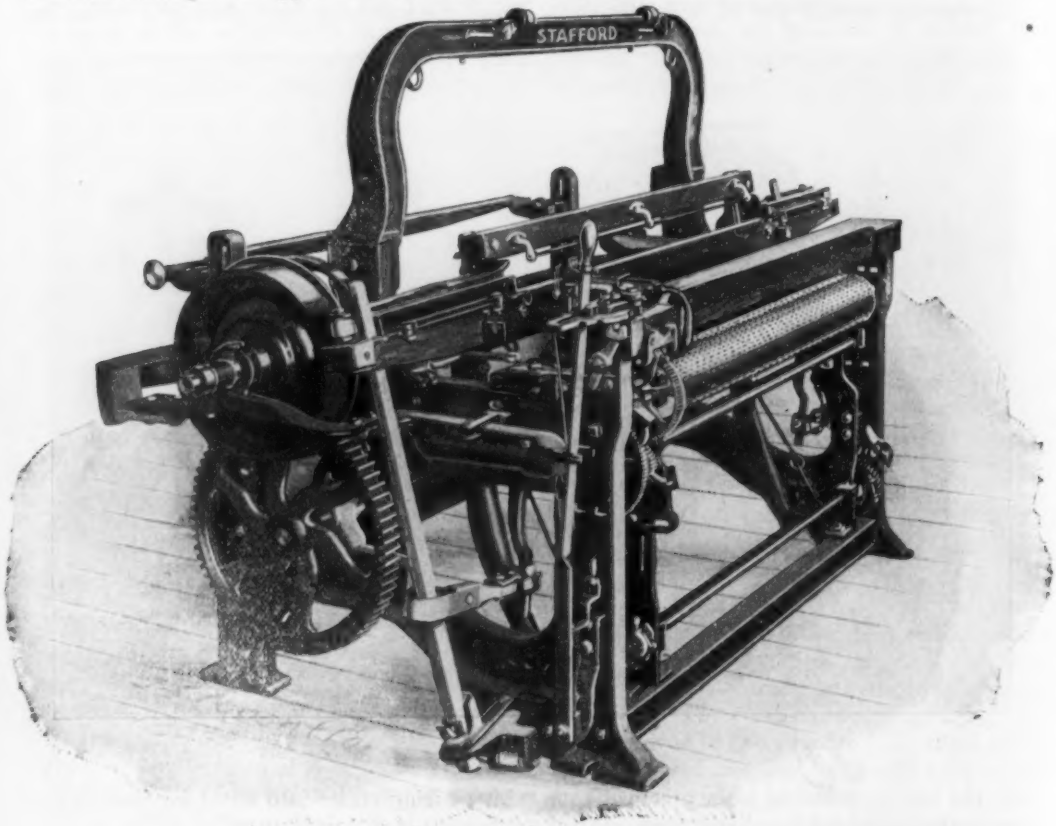
FIG. 2.

tact. This difficulty is overcome by spreading the steam in the form of a thin circular disk as shown in the illustration. Fig. 1 is a sectional, Fig. 2 a perspective view of the attachment. The steam passes through the pipe, as shown by the arrow, and is distributed between the two disks. The cold water is drawn through the upper and lower openings in these disks, is heated by the steam and then passes sideways in the form of a thin sheet into the body of the water. It is claimed that by this means steam at a high pressure can be forced into cold water with practically no noise. We understand it is used largely in dye works.

The hand comber in combing wool under the old system employed two combs, one as a "pad" comb, fixed on a post at a convenient height, by an iron rod fastened into the post.

THE STAFFORD 1902 MODEL COTTON LOOM.

The accompanying illustration shows the new "1902" model cotton loom built by The Geo. W. Stafford Co., Readville, Mass. The builders are confident that it embodies features of unusual merit.



THE STAFFORD 1902 MODEL COTTON LOOM.

The height from the floor to the breast beam has been reduced to accommodate women and weavers of low stature.

The loom is driven by a friction pulley which enables it be stopped easily; this reduces the wear and tear of belts and the shock to the loom in the event of its banging as the power is instantly removed without the necessity of transferring the belt from one pulley to another; the loom also requires much less power than when equipped with tight and loose pulleys.

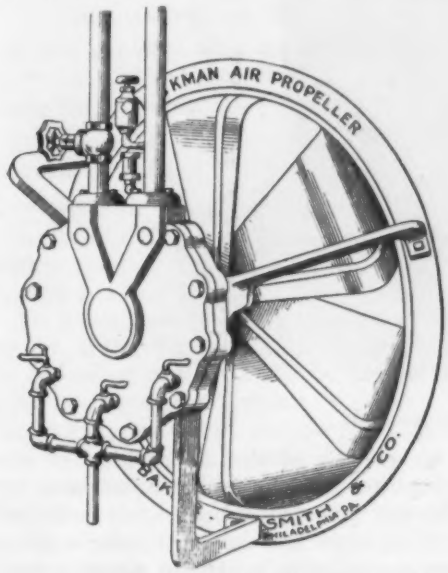
It is specially adapted for the application

of fancy motions such as dobbies, jacquards, box motions and various cam motions for special weaves; automatic filling change mechanisms can be easily attached. The picking cams are keyed to the shaft and a simple means of the adjustment of the cam toe is provided. All the parts are strong and well built and easily accessible.

Owing to its simple and solid construction the amount of breakage and wear has been reduced to a minimum. One important advantage claimed is its adaptability for different kinds of goods enabling the manufacturer to use it for any kind of fabric with slight additional expense.

THE BLACKMAN FAN.

The accompanying illustration shows a new special type of the Blackman fan, built by E. M. Nichols, 639 Arch St., Philadelphia, Pa., who claims that for moving large volumes of air economically, it has advantages which are peculiar to itself, and still greater advantages for special purposes. These fans are driven by belt or direct connected engine as desired. The direct connected fans can be adapted to a great many industrial purposes. The cost of the installation compares favorably with an ordinary belted fan when the shafting and belting required for the latter are taken into account. Once installed the engine driven fan requires little attention and the cost of operation is as low as that with other methods of driving.



There are very few, if any, places in mills where it is not convenient to run a small steam pipe for this engine. They have the advantage of wider variation of speed than is obtained when the fan is connected with the main system of mill shafting. It can also be operated whenever desired and without any other machinery being in motion.

For localities where there is much moisture, such as dyehouses, morocco rooms, finishing rooms, etc., it is the ideal method of ventilation, as no belting will stand the service and electric motors are impossible. In boiler rooms also they are found very serviceable for ventilation. These engines are economical in the use of steam and, if the lubricators are kept filled, require practically no attention. The builder states that many fans have been in use for three or four years without costing a cent for repairs and are still in perfect order. Another desirable feature of these fans is that they can be placed in any position to accomplish the results desired.

We have it on the authority of Caesar that the Britons in some parts of the country were "clothed in skins;" it is, on the other hand, supposed that the people in the southern parts of the island were well acquainted with the dressing, spinning and weaving both of wool and flax.

Vegetable silk is obtained in Paraguay from a tree about the size of a chestnut, bearing a boll 4 1/2 inches in diameter and 6 inches long. The silk is exceedingly light, and when the boll is picked to pieces it looks like down, except that it is glossy. Although it can be woven into thread, its chief utility would be for stuffing cushions, quilts, etc. The U. S. Consul states that it can be adapted for life-preserving appliances at sea. Its characteristic quality is its extreme lightness.

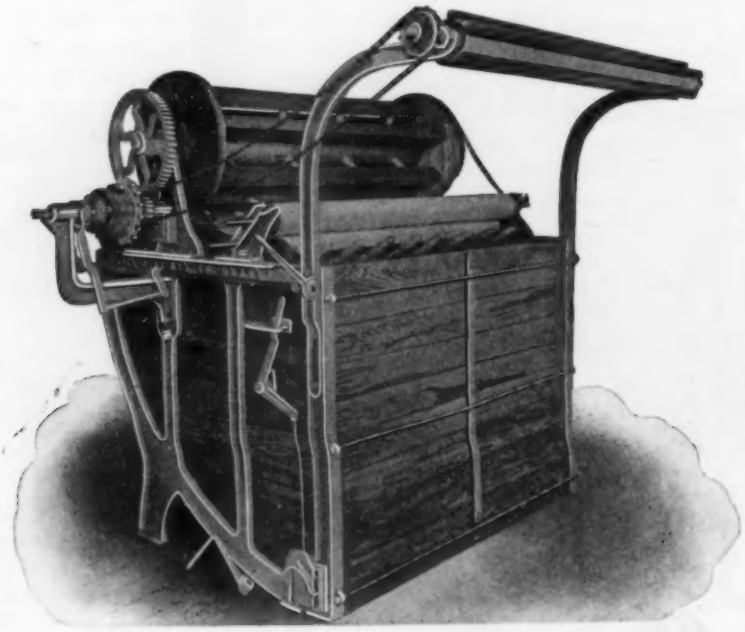
IMPROVED DYEING MACHINE.

Our illustration shows a piece dyeing machine built by the Rodney Hunt Machine Co., Orange, Mass., for either cloth or knit goods. The aim in constructing this machine has been to combine convenience and durability and the latest improvements have been incorporated throughout. The heavy iron frame is lined with cypress, a wood that is very durable, especially when in contact with water. The reel is made entirely of wood except the screws, which are of brass; in this way any rust spots are avoided. An iron shaft extends through the oak centre of the reel. If preferred reels with iron heads and flanges for supporting the wood bars are supplied with this machine.

The back of the tub is curved so that the pieces as they run from the reel will be carried gradually to the forward part of the bottom of the tub and in position to be raised easily by the reel; this prevents knotting and strain on the goods. A perforated partition runs across the front part of the tub far enough from the side to give space for introducing dyestuffs; a draw-off gate is provided at each end of the machine.

The reel may be driven either with a sprocket chain as shown in the illustration or with a belt, and with or without the intermediate gears, as desired.

The high reputation of the builders is a guarantee that the construction will be of the most thorough character throughout and the machines are built in any size desired to suit the requirements of different materials and goods.



RODNEY HUNT DYEING MACHINE.

An analysis of the composition of wool yielded the following: Out of 100 parts, carbon was 50.65; hydrogen, 7.03; nitrogen, 17.71; oxygen and sulphur, 24.61; while 98 per cent. would be organic, 2 per cent. would be ash.

Originally Australia had no native sheep whatever, and when the first attempts were made to introduce the animal from other countries, England, which had reserved this region as a convict settlement, looked with no particular favor upon the gathering of flocks and herds there.

Dyeing, Bleaching, Printing, Etc.

OBSERVATIONS ON THE USE OF ALIZARINE DYES.

The term alizarine dye is synonymous with the term "fast" dye with the exception that purchasers of fabrics said to be dyed with alizarines, expect as a rule, greater durability from such fabrics than from any other.

To secure shades that are fast to fulling, light, air, etc., with the dyes belonging to this class, it is necessary that the wool be thoroughly scoured for unless it is absolutely clean it will be impossible to mordant properly, and where imperfect mordanting exists an even distribution of the coloring matter cannot take place.

MORDANTING THE WOOL.

The best and most satisfactory mordant for wool to be afterwards dyed with the alizarines is the following:

Bichromate of Potash ....3 lbs.
Cream of Tartar .....2½ lbs.

Grey tartar or crude argols or lactic acid can be substituted one for the other without impairing the final results. In recent years lactic acid has taken a very prominent position as a mordanting assistant, but some dyers are of the opinion that it causes a too rapid deposition of the chrome on the fibres thereby causing uneven patches.

The mordanting bath being prepared, boil for 1½ to 2 hours then remove the wool, allow it to cool off, and wash well, when it is ready for dyeing. Mordanted wool should never be allowed to stand over night or for any great length of time where there is an opportunity for it to become dry; dry chromed wool cannot be satisfactorily wetted again.

In mordanting for light shades, use about one pound of bichromate of potash and one pound of tartar, while very heavy shades may require as much as four pounds of the former and three pounds of the latter for each 100 pounds of wool.

Over-chroming is a fault to be on the lookout for, but its ill effects when dyeing the alizarines is not as disastrous as when working with logwood.

Mordanted wool should be well washed so as to remove all traces of chrome; any chrome remaining in the wool mass, and not actually deposited on the fibres, only serves to cause a waste of an equivalent amount of dyestuffs.

DYEING.

In all cases when dyeing with the alizarines a certain quantity of acetic acid is necessary in the dyebath in order to counteract the effects of the presence of lime salts. No less than one quart of acetic acid, 9° Tw., and as much more as may be necessary to impart to the dyebath a slight acid reaction as shown by litmus paper.

Paste alizarines are worked by stirring into thin cream with about ten times their weight of cold water and added to the dyebath through a fine cloth sieve; this is a precautionary measure to keep out lumps and other insoluble matters.

The temperature of the dyebath is a matter of some concern. In order to obtain even results it will be found most satisfactory to commence dyeing at about 110° to 115° F., and gradually raising to the boil, maintaining at the latter temperature for about two hours; shorter time in the dyebath may lead the dyer to think that all the color has been taken up, but this is no proof that the color taken up has been fixed or combined with the mordant. To do this properly requires some little time at the boil.

Toning during the dyeing is not as difficult as it seems; many dyers add the shading product directly to the hot dyebath but this is sure to lead to irregularity in results. The proper method is to reduce the temperature of the bath by drawing off some of the exhausted bath and adding cold water to the remainder, so that the temperature will be equalized to about 120° F., then adding the

proper dyes, again bring to the boil and boil for another hour.

The very best practice, however, is to dye during the first hour at a temperature not exceeding 125° F., and to bring to the boiling point only when the bath is apparently exhausted of color, then boil for 1 to 1½ hours to develop the shade and fix it properly. Such practice yields the very best results and will be found most satisfactory for high class stock, whether raw stock or piece goods. By such a procedure any uneven results in the shade may be safely attributed to defective scouring, mordanting or washing after mordanting.

Colors dyed according to the method above outlined are as fast as it is possible to make them by any known process, and upon being fulled will be found to lose very little if anything in depth. If the soap lather be examined during the fulling and it appears to be tinted, the probability is that it is due to minute fragments of fibers. At any rate there will be no color removed that is capable of staining white. Should such dyed material lose color during the fulling the cause is imperfect scouring, weak or insufficient mordanting, or insufficient time in the dyebath.

The durability of the alizarines as a separate and distinct class is remarkable, they are not surpassed in fastness by any other known color and as for wearing they combine many good qualities, the principal one being that they dye the yarns and fibres through and through.

One characteristic feature of the alizarines is that they may be combined, one with the other, in any proportion without fear of consequences, hence the very widest range of shades can be obtained.

Combinations of alizarines and other classes of dyes are frequently made to meet special conditions, and although the so-called wood colors are not very often used for such purposes yet they work together in a most satisfactory manner. Very heavy shades may be thus secured by afterwards saddening with iron.

The one point necessary to observe in dyeing with the alizarines is to make sure of the presence of a slight excess of acetic acid, in the presence of which these dyes work at their best. The proportion of one quart to 250 gallons of dye liquor is practically the minimum quantity—even should the water used be distilled.

If the dyer should wish to improve the appearance of his work, it is possible for him to lustre his wool by means of a preliminary treatment with chlorine, the details of which are as follows: The yarn is worked in a bath heated to about 80° F., for 20 to 30 minutes, and containing about 2½ ozs. commercial muriatic acid per gallon of water. Afterwards wring slightly or allow to drain, and then pass through a bath of chloride of lime (bleaching powder) in the proportion of 2 ozs. per gallon of water, and heated to about the same temperature as the former bath. The time of immersion in this bath is about 20 to 30 minutes. The chloride of lime used should be made up previously into a strong, clear solution, and only so much of it used as will restore the working bath to its full strength.

After being removed from the chlorine bath the yarn is well washed, when it is ready to be mordanted.

The result of this treatment is peculiar, the fibre has a greatly increased affinity not only for mordants, but for coloring matters as well, while the very fullest shades are obtained by a very short time in the boiling dyebath. The strength of the material has in no way decreased nor has it any influence on the shade.

After dyeing, the material is rinsed and worked for about a quarter of an hour in a solution containing ¾ ounce of soap per gallon. The temperature of this bath should be about 80° F. From this soap bath, and without mixing, the material is worked in a bath containing ¾ oz. of conc. sulphuric acid per gallon for ¼ hour, and at the same temperature as the preceding baths.

For clothing wools and other fine grades there are no colors to take the place of the alizarines, although many attempts have been made to displace them with acid dyeing products, some of which, for proper "fixation" are after-chromed, but constituting at best only cheaper substitutes without the good qualities.

PRESERVATION OF HYPOCHLORITE OF SODA.

Ch. Sunder has recently published some interesting observations on the preparation and preservation of hypochlorite of soda (soda chemic), a reagent much employed in textile chemistry, and frequently prepared by the consumer himself.

Though the process of decomposing a solution of hypochlorite of calcium with anhydrous Solvay soda, as currently employed, proceeds in a perfectly neat manner, it has nevertheless been frequently observed that the resulting "soda-chemic" deteriorates rapidly, almost complete decomposition being attained sometimes on 24 hours' standing.

Investigation has shown that this voluntary decomposition has to be attributed to presence of small quantities of bicarbonate, whereof some brands of Solvay soda contain as much as five per cent.

If a solution of hypochlorite of calcium of 8 deg. Be. be decomposed with molecular quantities of pure carbonate of soda, the resulting "soda-chemic" suffers on 24 hours' standing in contact with the precipitate a loss of active chlorine amounting to but 5.5 per cent. of the total; by replacing as much carbonate of soda by bicarbonate as would correspond with an admixture of 5 per cent., under the same conditions a loss up to 84.5 per cent. has been experienced. In either case the decomposition proceeds somewhat more rapidly when the clear liquor is decanted.

The destructive effect of these small quantities of bicarbonate varies, however, considerably with the make of chloride of lime operated upon. The presence of quicklime in the latter exercises a protective action in that sense, that caustic soda is formed, which neutralizes the bicarbonate. The moment this free alkali is exhausted decomposition sets in. The observation that "soda-chemic" possessing an alkaline feel keeps well, whilst otherwise it rapidly deteriorates, gives empirical confirmation to these observations.

In preparing "soda-chemic" a certain alkalinity should therefore be always maintained as a safeguard against the action of bicarbonate that might be contained in the soda employed, an action to which at the present moment no definite chemical formula can be assigned. The danger otherwise concerns more the makers of a concentrated commercial article; for the consumer generally a strength suffices which can be easily maintained by working with a solution of crystal-soda, which may be presumed to be free from bicarbonate.—Textile Recorder.

DECATISING.

This is an unfamiliar term meaning a process the object of which is to improve the feel and lustre of textile fibres, a patent for a machine to do this having been recently granted in England. The essential feature of the process is the forcing or drawing of water, steam or air through the material being treated. The "decatising" roller is permanently fixed in the boiler, being revolved by worm gearing: access to the roller is obtained through a hinged lid in the side of the boiler. A specially constructed axle for the roller is part of the invention, having for its object the removal of condensed steam from the interior of the roller in dry decatising.

EXPERIMENTING IN THE BLEACH HOUSE.

How many dye or bleach-houses are fitted up with the necessary appliances for conducting trials with new methods? and how many mills afford their boss dyers and bleachers time and opportunity for making such trials? These questions are only interesting to the mill owner if he is convinced that trials of this kind are to his benefit. We think it is easy to bring forward arguments which will convince him.

There was never a time when textile processes were so constantly undergoing changes—always in the direction of improvement. It is an established fact, however, that it takes a long time to introduce a new process into a textile mill, not because the process could not be demonstrated to be useful, but simply because the want of facilities to experiment is not properly recognized, and therefore such process cannot be tried. This lack of opportunity is further supplemented

by a lack of interest in the dyer and bleacher to become acquainted with the progress of the times. They cannot see why they should spend a portion of their time looking into new methods when the old one is giving them and the office satisfaction. Thus it is really the office that must do the "kicking" either on color, quality, or cost.

In Europe this is very different. Most of the representative mills maintain a laboratory where everything new which comes to the notice of the mill is conscientiously and intelligently tried out and such new ideas as are shown to possess value are adopted. We believe this accounts to a large extent for the fact that goods marked "Made in Europe" command a larger consideration from the American consumer than do domestic goods.

If the Europeans, who, by the very conditions surrounding them, find it necessary to work in the most economical way possible, keep up the expense of an experimental station, this is perhaps the most convincing argument that can be brought to bear on the question. But is the expense really so very large? We cannot see why it should be. At most it means an assistant to the dyer or bleacher—perhaps one will do for both—so that the boss himself will have the necessary time to devote to the investigations. It furthermore calls for space in which to place such machines or tubs that may be required for the work, and lastly it calls for not only the hearty support of the office but for its peremptory command, to devote a certain part of the bosses' working hours to that purpose, naturally also supplemented by an appropriation for the incidental expenses. Summing up the expenses thus created, which we believe should be debited to the "Investment Account" instead of the "Expense Account," they should certainly be covered by a few hundred dollars per year, and we cannot think of any sum of money invested to better advantage than an amount set apart for what, for want of a better name, may be called "The Mill Laboratory."

A very striking proof of what we have stated above is furnished by that bleaching agent, peroxide of sodium. In a recent talk with a large manufacturer of this chemical we were shown proofs of how slowly the article had found entrance into the mills until it had been decided to furnish small trial vats to all such as want to investigate the process. These diminutive tubs, built on exactly the same lines as would be required for a large installation, are arranged so that they can be attached to a steam supply pipe in the dyehouse and without further preparation are then at once ready for a trial run which, being carried on under identical conditions as would be the future bleaching on a large scale, furnish all the data necessary for comparison and calculation.

What we want to lay stress on to support our argument is their surprising statement that the vats, on each trip which they make, return a customer. In other words, by presenting the proposition to the mill in a shape which calls for no preparation and for but very slight expense the mills are induced to make a trial, apparently the only thing needed to prove the advantages of the process.

It stands to reason, however, that only the very largest supply houses could make an arrangement of this kind, which calls for a very large expenditure of money in view of the many vats needed, while all this should really be unnecessary since it is entirely to the interest of every mill to be in position to investigate practically all the promising innovations, and at its own expense.

Using Egyptian and other imported cotton, the Bombay mills are now spinning, in appreciable quantity, yarns of No. 40 and upward. The production of the finer yarns —Nos. 31 to 40—largely increased last year, when it amounted to 12,500,000 pounds, the production in the preceding year being under 11,000,000 pounds.

Silk weaving which was at one time a common industry in India, and in respect of which certain towns like Surat were famous throughout the world, first gave way to Chinese silk and latterly to the French.

Embroidery has, to a large extent, kept its hold on the Indian craftsman. Shawls and chogas of Cashmere and the Punjab have hitherto defied competition and even imitation.

POTASH SOAPS AND THE SCOURING OF WOOLS.

The chemical treatment of medium and fine grades of wool requires that special care be taken to preserve at its best every good feature of the fibre and at the same time leave it in a condition fit for subsequent treatment. It is a very easy matter to cleanse the wool fibres thoroughly but it is not quite as easy to be assured that the elasticity, suppleness, and lustre are unimpaired.

At the present time two broad systems of wool scouring are in use, one consisting of the treatment with volatile solvents, and which need not be discussed here at this time, and the other is the usual method of soap washing which is the one more generally used. In its consideration, however, the practical scourer is brought to a realization that there is a very great difference in the scouring efficiency of soaps, not only from an actual cleansing standpoint but from the condition in which the wool is left.

All wool contains a certain amount of natural grease and soap, the latter is quite soluble in warm water and if the grease were removed would constitute a very effective scouring agent. This natural soap is a potash soap and from its mild action upon the very finest fibres is to be regarded as a typical cleansing substance, and viewed in this light many wool men make use of the next best substitute to this natural soap by operating on wool with the potash soaps of commerce in preference to the so-called "hard" or soda soaps.

Soda. as generally used in wool scouring, is to be regarded as a detriment, especially when it is dumped into the scouring bowls by the pailful under the mistaken notion that it will help the small quantity of soap used to do the work. The soda soap alone is bad enough but to fortify the scour liquors with a large quantity of carbonated alkali is not the very best practice. The action of soda as ordinarily used is very peculiar upon wool. Unless it is completely removed by thorough washing after scouring and before drying, it frequently causes the fibres to become yellower, and what would otherwise be a clean white is a pronounced cream. Again, too much soda in a scour bath along with soda soap causes the fibres to take up and hold firmly a large proportion of the impurities of the scour liquors and which cannot be removed by any practical process. These few objections are simply made prominent here as showing those features of the use of soda soaps that potash soaps do not possess.

Potash soaps are all soft, that is, give the appearance of having a very large proportion of water, but such is not the case; a good grade of potash soap will contain on an average less water than a soda soap, while its scouring efficiency is much greater. Owing to the process of manufacturing a soft or potash soap it is impossible to remove the glycerine from the batch on account of the inability to "salt-out" the curd, which is always done with a soda or hard soap.

Potash soaps are always mild in their action, having no influence on the fibres but dissolving completely the natural impurities and retaining them in solution so that they can be completely removed by subsequent washing. Such scoured wool is always soft and fluffy and free from any brittleness, thereby reducing the amount of waste in carding and combing that is frequently traced to "alkali burning."

The influence of potash scoured wool in the dye house is seen at once by the brighter colors that are obtained, and specially where piece goods are dyed. It is a fact that much of the complaints regarding "shading" can be traced to the presence of soda soaps left in the scoured pieces which could not be successfully removed by the ordinary process of rinsing. If, under the same circumstances, a potash soap was used, owing to its great solubility in water, it could be completely washed out, removing the lurking danger of streaks, etc.

Proper scouring not only implies proper soaps, water, and apparatus, but it absolutely requires that some attention be given to the requirements of the wool to be scoured. Some grades of wool can be scoured to advantage at one temperature, while others require a different one. As a general, though somewhat elastic rule, it will always be safe to operate at as low a temperature as possible, not exceeding 130° F., for fine wools: it

will be entirely safe to heat the soap liquors to 120° F., and work at that temperature for such a length of time as will ensure complete scouring. The writer thoroughly disapproves of one fixed time for all classes of wool,—a custom only too prevalent in the majority of mills. It will be found that less trouble will follow a batch of wool through the mill if it is delivered to the picker-boss absolutely clean and dry and in a light, fluffy, and lively condition,—a condition that can only be controlled during the scouring.

It is a serious mistake to imagine that high temperatures facilitate scouring or cause better results. The most serious result to be accounted for under such circumstances is the destruction of the curl of the fibres, the loss of which much impairs the spinning. It is not to be understood that clean wool will not be obtained by such treatment, but such wool, clean as it may be, has lost one of its most important characteristics and has lost in value proportionately.

The question is sometimes asked "How much alkali should be used when using a potash soap?" As a rule none whatever, for the reason that any such addition will not cause a more rapid dissolving of the wool grease, etc., and again, it will be confirmed by observation that a proper quantity—not an excessive quantity—of potash soap will properly cleanse the wool if time and temperature are attended to.

Systematic wool scouring should take place in no less than three scouring bowls—five would be better where large quantities of wool are to be handled daily, the scour liquors flowing continuously from one bowl to the other in an opposite direction to that of the wool, so that clean, warm water is always entering the bowl from which the clean wool is removed, while the dirtiest scour liquors are removed from the bowl when the unscoured wool enters. Where the plant consists of five machines the last is for rinsing, the next for weak fresh soap, the succeeding one for stronger soap liquor, and the remaining two (preferably arranged as a pair side by side) for the strongest soap liquor, for in these the greatest amount of cleansing is done. The time of passage through these two bowls may be advantageously half the speed of the remaining machines. Potash soaps have never received the proper attention that they deserve from our manufacturers mainly on account of their first cost, which is slightly higher than a corresponding weight of soda soap, but no one who has gone into this subject will doubt for a moment that the best results will always be credited to the soft soap.

Of course, for scouring low grade wools, hairs, and other similar stock, perhaps potash soaps will be too costly, but on the so-called clothing wools such soaps, when once introduced and their action understood, will not be displaced.

In large mills, too, where quantities of such soap could be used to good advantage, a uniform quality of high grade soap could be manufactured on the premises, without any very great equipment. It is a subject worth looking into.

New Color Cards.

Anthracene Chrome Violet B; Cassella Color Company, 182 Front St., New York City.

Two samples of woolen yarn and two of woolen piece goods dyed with Anthracene Chrome Violet B.

Dianil Green G and Dianil Dark Green B. H. A. Metz & Co., 122 Hudson St., New York City.

This card shows eight samples of different shades of sage green dyed with Dianil Green G and Dianil Dark Green B.

Pluto Black A Extra. Farbenfabriken of Elberfeld Co., 40 Stone St., New York City.

Samples of satin and half wool Italian cloth, dyed with Pluto Black A Extra.

Benzo Fast Scarlet 5 B S. Farbenfabriken of Elberfeld Co., 40 Stone St., New York City.

Five samples of cotton piece goods dyed and printed with Benzo Fast Scarlet 5 B S.

Dyeing Colors Fast to Acid on Loose Cotton. Cassella Color Co., 182 Front St., New York City.

This case shows twenty-eight samples of loose cotton placed in compartments from which they may be easily drawn for comparison.

Chromate Black. Berlin Aniline Works, 213 Water St., New York City.

Three samples of raw wool, three of woolen yarn and two of woolen cloth dyed with Chromate Black 6B and 4B T.

Acid Chrome Brown T. Farbenfabriken of Elberfeld Co., 40 Stone St., New York City.

This card shows a sample of woolen piece goods dyed brown with Acid Chrome Brown T.

Azo Merino Black. Cassella Color Co., 182 Front St., New York City.

Six samples of woolen goods dyed with Azo Merino Black B and 6 B are shown on this card. Two of them show attractive stripe effects obtained with white cotton yarn, the shade of which is not affected by the wool dye.

Acid Violet B W; Farbenfabriken of Elberfeld Co., 40 Stone St., New York City.

One sample of worsted piece goods dyed with Acid Violet B W.

Diamond Black P V; Farbenfabriken of Elberfeld Co., 40 Stone St., New York City.

One sample of woolen yarn and one of piece goods dyed with Diamond Black P V.

Acid Black 4 B L. Farbenfabriken of Elberfeld Co., 40 Stone St., New York City.

One sample of woolen yarn and two of woolen piece goods dyed black with Acid Black 4 B L. One of the fabrics shows a pin check obtained by the use of white cotton which is not colored by the wool dye.

DYE RECIPES.

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD RECORD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16-page pamphlet, in convenient form for preservation. Subscription price for the Dyers' Supplement $1.00 per year.

Recipe No. 49.

Green on Worsted Yarn.

Ketone Green N N on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Ketone Green N N.
(A Klipstein & Co., 122 Pearl St., New York.)
10 lbs. Glauber's Salt.
3 lbs. Sulphuric Acid.

Enter at 140° F., bring to boil and dye at a boil for one hour.

Ketone Green N N produces a very level and pleasing shade of green, possessing the usual properties of the acid dyestuffs.

Recipe No. 50.

Red on Worsted Yarn.

Azo Red G on 100 lbs. of worsted yarn. Prepare the dye bath with

3 lbs. Azo Red G.
(C. Bischoff & Co., 88 Park Place, New York.)
5 lbs. Sulphuric Acid.
15 lbs. Glauber's Salt.

Enter the yarn at 160° F., bring to a boil and dye at a boiling temperature for one hour.

Azo Red G produces an excellent shade of red which is exceedingly fast to sunlight and washing.

Recipe No. 51.

Black on Worsted Yarn.

Chromate Black 4 B on 100 lbs. of worsted yarn. Prepare the dye bath at a boil with

6 lbs. Chromate Black 4 B.
(Berlin Aniline Works, 213-215 Water St., New York.)
10 lbs. Glauber's Salt.
5 lbs. Acetic Acid.

The dyestuff should be dissolved in boiling water and added to the bath in this condition, for the color will precipitate upon cooling.

Cool the bath to 150° to 160° F., with cold water and enter the material. Raise to a boil during one-half hour, boil for a further one-half hour and carefully add in several portions a much diluted solution of

4 lbs. Bisulphate of Soda.
1½ lbs. Sulphuric Acid.

Boil one hour longer, when the bath should be practically exhausted.

The yarn is then aftertreated in a separate bath containing

2 lbs. Potassium Dichromate.
1½ lbs. Blue Stone.
3 lbs. Acetic Acid.

Enter at 160° F., raise to the boil and continue the boiling for about three-quarters of an hour and rinse.

In some cases, especially with loose wool, it is advantageous to carry out the aftertreatment in the dye bath itself.

Chromate Black 4 B possesses very good fastness to light, milling, alkalies and acids. It gives a deep, even and rich shade of black.

Recipe No. 52.

Orange on Woolen Cloth.

Orange Crystals on 100 lbs. of woolen cloth. Prepare the dye bath with

2 lbs. Orange Crystals.
(New York and Boston Dyewood Co., 156 William St., New York.)
4 lbs. Sulphuric Acid.
10 lbs. Glauber's Salt.

Enter cloth at 160° F., bring to a boil and dye at a boiling temperature for one hour.

Orange Crystals produce an excellent and brilliant shade of orange, dyes very level, and possesses excellent fastness.

Recipe No. 53.

Crimson on Cotton Yarn.

Dianil Crimson G on 100 lbs. cotton yarn. Prepare the dye bath with

2 lbs. Dianil Crimson G.
(H. A. Metz & Co., 122 Hudson St., New York.)
2 lbs. Soda Crystals.
20 lbs. Common Salt.

Enter at 180° F., bring to a boil and dye at a boiling temperature for one hour.

Dianil Crimson G is easily soluble in water, equalizes well and possesses very good fastness.

Recipe No. 54.

Blue on Worsted Yarn.

Domingo Blue B B on 100 lbs. of worsted yarn. Prepare the dye bath with

4 lbs. Domingo Blue B B.
(C. Bischoff & Co., 88 Park Place, New York.)
15 lbs. Glauber's Salt.

Enter yarn at 170° F., bring to a boil and dye at a boil for one-half hour, then add

3 to 5 lbs. Acetic Acid

and boil one-half hour longer and add

1 lb. Sulphuric Acid,

which should exhaust the dye bath in a few minutes.

Domingo Blue B B stands washing exceedingly well, and is fast to sunlight.

Recipe No. 55.

Garnet on Cotton Yarn.

Garnet R B on 100 lbs. of cotton yarn. First mordant the yarn by steeping over night in a bath made up with

20 lbs. Sumac Extract

and necessary amount of water.

Wring without washing and work for fifteen to twenty minutes at a temperature of 100° F., in a bath containing

12 oz. Antimony Salt.
4 oz. Sal Soda.

then wring and dye in a bath made up with

2 lbs. Garnet R B.
(Bosson & Lane, Atlantic, Mass.)

and

1% Acetic Acid.

Garnet R B produces an excellent shade of garnet, with very good fastness to washing.

Recipe No. 56.

Green on Cotton Yarn.

Dianil Green G on 100 lbs. of cotton yarn. Prepare the dye bath with

2 lbs. Dianil Green G.
(H. A. Metz & Co., 122 Hudson St., New York.)
20 lbs. Common Salt.

Enter yarn at 180° F., bring to a boil and dye at a boiling temperature for one hour.

Dianil Green G is distinguished for its level dyeing property, its fastness to washing and to light, and is suitable for the production of compound shades and for the dyeing of cotton and silk and cotton and wool union goods.

Recipe No. 57.

Black on Worsted Yarn.

Alizarine Black B on 100 lbs. of worsted yarn. Prepare the dye bath with

5 lbs. Alizarine Black B.
(Thomas Leyland & Co., 53 India St., Boston.)
5 lbs. Acetic Acid.

Enter yarn at 140° F., raise to a boil and dye at a boil for one hour, or until bath is exhausted, add about

2 lbs. Potassium Dichromate

to the bath and boil fifteen minutes longer.

Alizarine Black B gives a particularly bloomy shade of black, and is very fast to light and washing. If the chroming is omitted, bluer and brighter shades are produced, but they are not as fast.

Recipe No. 58.

Yellow on Worsted Yarn.

Alizarine Yellow G G on 100 lbs. of worsted yarn. Prepare the dye bath with

2 lbs. Alizarine Yellow G G.
(E. M. Thayer & Co., 106-112 Broad St., Boston.)
10 lbs. Glauber's Salt.
3 lbs. Sulphuric Acid.

Enter yarn at 120° F., bring to a boil and dye at a boil for one hour.

Alizarine Yellow G G dyes very evenly and produces very pleasing shades of yellow with low percentages.

Recipe No. 59.

Black on Worsted Yarn.

Chromate Black 6 B on 100 lbs. of worsted yarn. Prepare the dye bath at a boil with

6 lbs. Chromate Black 6 B.
(Berlin Aniline Works, 213-215 Water St., New York.)
10 lbs. Glauber's Salt.
5 lbs. Acetic Acid.

The dye stuff should be dissolved in boiling water and added to the bath in this condition, for the color precipitates upon cooling.

Cool to 150° to 160° F. with cold water and enter the material. Raise to a boil during 1/2 hour, boil for a further 1/2 hour, and carefully add in several portions, a much diluted solution of

4 lbs. Bisulphate of Soda.
1½ lbs. Sulphuric Acid.

Boil one hour longer, when the bath should be practically exhausted. The yarn is then aftertreated in a separate bath containing

2 lbs. Potassium Dichromate.
1½ lbs. Blue Stone.
3 lbs. Acetic Acid.

Enter at 160° F., raise to a boil, continue the boiling for about 3/4 of an hour and rinse.

In some cases, especially with loose wool, it is advantageous to carry out the after treatment in the dyebath itself.

Chromate Black 6 B possesses very good fastness to light, milling, alkalies and acids. It gives a deep, even and rich shade of black.

Recipe No. 60.

Green on Worsted Yarn.

Brilliant Milling Green B on 100 lbs. worsted yarn. Prepare the dye bath with

2 lbs. Brilliant Milling Green B.
(Cassella Color Co., 182 Front St., New York.)
10 lbs. Glauber's Salt.
3 lbs. Sulphuric Acid.

Enter yarn at 100° to 120° F., bring slowly to a boil and dye at a boil for one and one-fourth hours.

Brilliant Milling Green B possesses excellent coloring power and purity of shade and is fast to milling.

Recipe No. 61.

Scarlet on Cotton Yarn.

Benzo Fast Scarlet 5 B S on 100 lbs. cotton yarn. Prepare dye bath with

4 lbs. Benzo Fast Scarlet 5 B S.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)
2 lbs. Soda Ash.
20 lbs. Common Salt.

Enter at 180° F., bring to a boil and dye at a boiling temperature for one hour.

Benzo Fast Scarlet 5 B S for a direct red possesses remarkable fastness to acids and is comparatively fast to light. It gives a very clear shade and dyes very evenly.

Recipe No. 62.

Black on Worsted Yarn.

Nap. Black D on 100 lbs. worsted yarn. Prepare the dye bath with

8 lbs. Nap. Black D.
(Read, Holliday & Sons, Ltd., 7 Platt St., New York.)
10 lbs. Glauber's Salt.
3 lbs. Sulphuric Acid.

Enter at 170° F., bring to a boil and dye at a boil for one hour.

Nap, Black D gives an excellent shade of acid black on wool

Recipe No. 63.

Yellow on Cotton Yarn.

Phenidine Yellow No. 6238 on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Phenidine Yellow No. 6238.
(Sykes & Street, 85 Water St., New York.)
25 lbs. Common Salt.

Enter at 170° F., bring to a boil and dye at a boiling temperature for one hour.

Phenidine Yellow No. 6238 produces an excellent yellow, possessing good fastness.

Recipe No. 64.

Black on Worsted Yarn.

Cashmere Black T on 100 lbs. of worsted yarn. Prepare dye bath with

6 lbs. Cashmere Black T.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)
10 lbs. Glauber's Salt.
15 lbs. Sodium Bisulphate.

Enter at 170° F., bring to a boil and dye at a boiling temperature for one hour.

Cashmere Black T produces an excellent shade, similar to logwood black. It dyes extremely level and its fastness is good.

CORRECTION.

An error was made in the March issue in the exhibition of a color dyed with Tetrazo Cutch Brown. The proper shade was not shown with the recipe but will appear in May.

In most parts of India the climate and the habits of the people discourage the use of woolens, and they are worn mainly by the better classes in northern India, and then only in the colder months of the year. Nor is the use of woolen bed clothes at all a habit among them, the quilted razai of cotton or the cotton sheet taking the place of the blanket very commonly.

Mill News.

COTTON.

New Mills.

*Alabama. Livingston. The new plant reported to be established here by T. L. Smith and others, will be known as the Livingston Mfg. Co. Company has been capitalized at $50,000. T. M. Tartt is president, T. L. Smith, treasurer and general manager and J. B. Barnes, superintendent. Work will start about April 1st, on construction of the mill, which they expect to have in operation by June or July, making cotton filled goods. They will use steam and sell goods direct.

*Massachusetts, Fall River. Work is being pushed on the installation of machinery in the new Davis Mills. A spur track which ran from the N. Y., N. H. & H. tracks through the Arkwright Mill yard has been extended, making it convenient for handling the machinery.

*Massachusetts, New Bedford. Work has been started in the card room of the Butler Mill and a few operatives have been put at grinding cards. It is expected that the pickers will be started up next week. Work is progressing on the setting up of the looms, which will be put up in sections of twelve.

*Massachusetts, Rockland. Operations will be started May 1st, by the Rockland Braid Works, H. J. Kennedy, proprietor. Gasoline will be used. Will sell direct. About 10 people will be employed.

*Massachusetts, Springfield. The new plant of the Bay State Thread Works has been put in operation. This company is capitalized at $75,000, and manufactures cotton thread for manufacturers, spools, tubes and cones, bleaching, dyeing and finishing at the mill. Edwin L. Smith, formerly of the Warren Thread Works, is president of the company; M. C. Birnie, treasurer and E. R. Dyer, superintendent.

*Mississippi, Magnolia. It is expected that the Magnolia Cotton Mills will have the buildings completed by May and that contracts for machinery and equipment have been placed. Active operations will begin in the fall.

New York, Buffalo. Druar & Hunsicker, of 288 Franklin Street, are preparing plans for a new mill to be built at Black Rock, for John Druar, (of the above firm) for manufacturing cotton batting. The building will be two stories high, brick. He contemplates manufacturing other finished products in the future.

*New York, Cohoes. The Page Manufacturing Company, reported having purchased a site on Saratoga Street, will start work at once on erection of a modern mill, with all the latest improved machinery for manufacturing cotton batts, mattresses and shoddy. They will operate 15 cards, 9 garnetts and 4 pickers.

New York, Nyack. The Nyack Spinning Company has been incorporated with capital stock $200.000. F. H. Brayton of the Nyack Knitting Company, is interested in the new concern, which they propose consolidating, after a while, with the knitting mill, the latter having outgrown capital and facilities.

*North Carolina, Burlington. The new mill reported under way at Glen Raven, Tenn., to be built by John Q. Gant Manufacturing Co., as the Glen Raven Mills, will be built at Burlington. The plant is now under construction and it is expected will be completed by May 1st. Will be equipped with 3,000 ring spindles and 100 looms for making cotton fabrics. J. Q. Gant and Jas. Erwin Gant are interested.

North Carolina, Concord. The Odell Manufacturing Company will install 10,000 spindles for manufacturing fine yarns, as high as No. 60, in new mill, reported to be built. The capital stock has been increased for the purpose; about $200,000 to be expended.

*North Carolina, Dallas. The new cotton mill reported to be built here will be known as the Morowebb Cotton Mill. Capital stock is placed at $100,000. Plant will be built this year and equipped with 5,000 ring spindles. T. M. Fayssoux is president of the company which will operate same; J. D. Moore, treasurer and J. O. White, superintendent. Chas. J. Webb & Co. will sell the product.

*North Carolina, Hickory. Work on construction of new buildings for the Ivey Mills will start about April 1st. A. A. Shuford is president of the company capitalized at $75,000, and G. F. Ivey, treasurer, agent and superintendent. They will make fine satteens, operating 4,560 ring spindles and 200 looms, using steam power. Expect to begin production about August.

*North Carolina, Lincolnton. Contract has been let for the erection of the new cotton mill, previously reported to be built here by R. S. Abernathy and others. The building will be 212 by 75 feet, three stories, with boiler and engine room, 40 by 80 feet. The contract calls for completion of all the outside work by August 15th, and it is thought that plant will be ready to start production of goods early in September.

*South Carolina, Cateechee. The new mill which was reported from Central, S. C., in which Col. D. K. Norris is interested, is an addition to the Norris Cotton Mills, and will be built at Cateechee, at once. The addition will contain 5,000 spindles and 100 looms, making a total of 18,248 spindles and 452 looms. They make sheetings. They are in the market for much of the equipment.

*South Carolina, Greenwood. Work is well under way on the No. 2 mill for the Greenwood Cotton Mills. The foundations have been dug and work will proceed on the building.

*Virginia, Danville. Contract has been awarded for construction of two of the main buildings for the Dan River Power & Manufacturing Co., a weave shed, 130 by 147 feet, with saw tooth roof, and cloth house, 200 by 75 feet, three stories high.

Enlargements and Improvements.

*Alabama, Opelika. Work is under way on addition to the Opelika Cotton Mill, which recently increased the capital stock $50,000 for the purpose. They will install 3,000 spindles and later 2,000 more.

Maine, Biddeford. A large number of improved looms are being placed in the Laconia Mills.

Massachusetts, Bondsville. Eight new spinning frames are being installed in the Boston Duck Company's mill.

Massachusetts, Chelsea. Contract has been let by the Boston Gore & Web Mfg. Co. for the erection of a wood addition to the mill, 25 by 80 feet, two stories.

*New Hampshire, Machester. Work has begun on removing the equipment of the Jefferson Mill cloth room of the Amoskeag Corporation, to the large No. 11 mill cloth room. The space vacated in the Jefferson plant will be filled with spinning frames and other preparatory machinery. Gen. Henry A. Farrington will have full management of the cloth rooms.

New Hampshire, Nashua. The Nashua Cotton Mills have had ground broken for the erection of a new cloth room. Additional help will be employed when work has been completed.

New York, Jamestown. A four story addition will be built this spring for the Chautauqua Towel Mills. Much of the space will be used for stock room and bleaching department. Eight new looms will also be put in.

North Carolina, Gastonia. The Trenton Cotton Mills have let contracts for 2,000 additional spindles and other machinery to be installed. They expect that the new machinery will be in operation the latter part of May.

North Carolina, Gastonia. The Ozark Cotton Mills are installing 1,000 more spindles in the mill. Other improvements are contemplated.

North Carolina, Henderson. An addition, 100 by 75 feet, is under construction for the Henderson Cotton Mill. Additional machinery will be installed.

North Carolina, Mount Holly. The Tuckaseege Manufacturing Company contemplates building an addition to the mill, probably same size of the present plant.

North Carolina, Rockingham. Contract has been let by the Pee Dee Mfg. Co. for the erection of an additional building, 2 stories, to No. 2 mill, in which they will install 2,500 spindles and 200 looms.

Pennsylvania, Philadelphia. Regar & Oughton, proprietors of the Matred Mills, manufacturing cotton and silk upholstery goods, 1824 Cadwalader Street, will soon remove to new mill recently completed at 10th and Diamond Streets. Several new Jacquard looms will probably be installed in new location.

Rhode Island, Westerly. Foundations have been completed for an addition to the picker department of the Lorraine Manufacturing Co.'s mill on Mechanic Street. Extensive improvements will also be made to the card room.

South Carolina, Newberry. An extension is being built to the Mollohon Cotton Mills, making the building three stories high. An addition is also to be made to the boiler room.

*South Carolina, Woodruff. The Woodruff Cotton Mills, previously reported to increase the spindles and looms in the mill, now operate 14,000 spindles and 325 looms. They are adding 16,000 spindles and 375 looms, which will give them a total of 30,000 ring spindles and 700 looms.

South Carolina, Yorkville. The York Cotton Mills have built a two story addition, 54 by 80 feet, and will instal additional machinery in same. The combing machinery to be added, has been ordered.

Mills Starting Up.

*Arkansas, Mammoth Spring. The Steele's Cotton Mills have been incorporated with capital stock of $150,000, of which $25,000 has been subscribed. They will operate the plant recently reported purchased by Robert L. Steele of Rockingham, N. C., viz: Mammoth Spring Cotton Mills. Robert L. Steele is president of the company; G. C. Burford, treasurer, and P. B. Hynson, secretary. This mill is equipped with 8,000 spindles and 200 looms.

*Georgia, Rome. T. W. Lipscomb is manager of the Floyd Cotton Mills recently organized to operate the Rome Cotton Factory. In addition to others mentioned in previous issue, is Hugh T. Inman, owning majority of the stock. They propose putting in $35,000 worth of improvements in the mill, now equipped with 5,000 spindles and making duck.

North Carolina, Concord. Preparations are being made for resuming operations in the Lippard Yarn Mill, which has been idle some little time. The machinery is being overhauled.

WOOLEN.

New Mills.

*Kentucky, Louisville. The new mill upon which work of construction will start at once by the Hope Worsted Mills, Chas. F. Murphy (Boston) president, will manufacture worsted yarns. The equipment will consist of 6 combs (English system); 9 worsted cards; 34 spinning frames and 17 twisting frames.

*Massachusetts, Worcester. Geo. Daniels, formerly with the Bay State Worsted Co., and recently reported having started separate plant, operates same as the Daniels' Worsted Mill. Cotton worsteds are made. Plant is equipped with 27 looms and operated by steam. Goods are finished at the mill. L. Robenstein & Co., N. Y., are the selling agents for product.

Michigan, Detroit. A small plant has recently been started on Bagg Street, by John Gillooly, making ingrain and rag carpets. Purchase yarn.

New York, Frankfort. The Mohawk Valley Woolen Company, has been recently incorporated with capital stock of $50,000, and will operate the plant formerly run by the Frankfort Linen Mills, making paper makers' felts, jackets and special woolens. They will equip plant with 2 sets cards and 10 looms, using steam power. Will sell goods direct. James Hamer is president, superintendent and buyer for the company and Thos. F. McKeough, secretary and treasurer. A dye house is also attached to the mill.

New York, Utica. Foster, Allison & Co., expect to have their new mattress felt mill in operation about April 15th. The picking and garnett machinery has been ordered and the boiler is being placed in position. They will occupy the old Savage Arm building at Broad and Hubbell Streets.

Enlargements and Improvements.

Maine, Newport. It is reported that the wool pulling plant here, operated by J. W. Weymouth & Co., is to be greatly enlarged and a scouring plant capable of handling thousands of bales annually will be established.

Maine, Pittsfield. The Robert Dobson Company is considering installing a much larger steam plant for use in connection with the Pioneer Woolen Mill. It will probably be of about double the capacity of the present one and large enough so that there will be practically an auxiliary outfit in case of need.

*Maine, Skowhegan The Marston Worsted Co. expects to have about 80 of the looms in the new mill in operation by April 1st. They have already started forty in operation. The weaving will be done on the first floor, second to be for sewing, dry finishing, burling, folding and shipping departments, which have been removed from the old building and been started up. A separate building has been erected for the dyeing and wet finishing departments. Brick power house is equipped with two engines of 100 and 65 h. p .respectively.

Massachusetts, Cherry Valley. The Valley Woolen Mill is to have a new picker house erected. Building will be 105 by 56 feet, brick, one story.

*Massachusetts, Gleasondale. The new addition to be built to A. D. Gleason's mill, will be two stories. 75 by 40 feet.

New York, Lestershire. A new building, 100 by 86 feet, four stories high, to be used exclusively for manufacturing felts, is under construction for the Faatz-Reynolds Felting Co. It is expected that same will be completed in about 60 days.

Ohio, Zanesville. An additional building is to be built for the Zanesville Woolen Company, who will install a number of looms in same.

Pennsylvania, Philadelphia. An addition, 35 by 56 feet, two stories, is to be built to the Hugh French Estate mill, Cumberland and Orianna Streets.

Pennsylvania, Philadelphia. Contract has been let by John F. Lodge, of J. F. Lodge & Son, manufacturers of cotton and woolen carpet yarns, for the erection of a new mill, 122 by 42 feet, three stories, and a picker house, 42 by 72 feet, one story and basement, to be built on Hart Lane.

Pennsylvania, Philadelphia. C. R. Simister & Son have closed their shoddy plant for two weeks, for the purpose of installing a new 350 h. p. engine. They are also building a new picker house, 60 by 70 feet. Seven new sets of cards have recently been installed and will be put in operation as soon as the new engine has been put in place.

Pennsylvania, Philadelphia. A new three story addition, 54 by 113 feet, is to be erected to James and Geo. D. Bromley's carpet mill, at Adams and Jasper Streets.

Rhode Island, Peace Dale. The Doane Worsted Mill, Edward and John Doane, has been undergoing a number of improvements. They have recently installed three new looms and have two more on the way. Fancy worsteds, for men's suitings, are made exclusively.

Rhode Island, Providence. The American Woolen Co. contemplates making many alterations and improvements to the Weybosset Mill, among which is a new lighting plant. Thomas Corcoran has taken charge as agent of the plant.

Tennessee, Chattanooga. Plans are being prepared by the Extract Wool & Merino Company for a three-story brick building, to be equipped with additional machinery. The company recently increased the capital stock $20,000 for this purpose.

Virginia, Old Town. W. M. Grover & Sons, proprietors of the Grayson Woolen Mills, are making small additions to their machinery equipment.

Mills Starting Up.

*Delaware, New Castle. Operations have been started by the Fort Casimir Woolen Mills, Inc., with capital stock of $100,000, Geo. G. Knowles, president and Eugene LaGrove (Brooklyn), vice-president. They make fancy wool cassimeres and cotton warp piece goods, operating 8 sets cards and 200 looms. They will install 50 new looms and 8 sets cards, 3 shoddy pickers and one card. Goods are sold through Bacon & Co., and H. W. T. Mali & Co. A dye house is attached to the mill.

KNIT.

For Knitting Mill News, see Knitting Department.

SILK.

New Mills.

*Connecticut, Norwalk. It is reported that operations will probably be started up in Loth & Co.'s new mill by April 1st, manufacturing silk ribbons. The first floor will be equipped with warping machines (25), winding machines (22) and finished machinery; also room for storage. One hundred and seventy-five looms will be installed on the second floor of the mill, which is about 215 by 108 feet. Two 100 h. p. boilers have been installed in the boiler house. The company will have its own electric light plant.

*New Jersey, Paterson. The Hamilton Silk Company, recently incorporated with capital stock

of $100,000, will operate the plant reported started recently by A. A. Fischer. Mr. Fischer is president of the new plant and Thomas E. Platt, treasurer.

*New York, Owego. The branch mill established here by Julius Kayser & Co., is merely for finishing.

*Pennsylvania, Allentown. The new mill to be started here in building secured by Dr. A. H. Ballett, is for D. G. Dery, operating mills at Catasauqua and East Mauch Chunk. Dress silks will be made.

*Pennsylvania, New Castle. The West Pittsburg Silk Mfg. Co., incorporated with capital stock of $100,000, expects to begin operations early in May, making dress goods, taffetas, peau de soie, satins, pongees, etc. They will operate 2,500 spindles and 200 looms and sell goods direct. J. P. Shorrock is president, superintendent and buyer of the concern; C. A. Glaser, treasurer.

Pennsylvania, So. Bethlehem. The Iroquois Silk Company has been incorporated with capital stock of $100,000, by E. J. Lipps and Jean Althenn, of this place and John B. Cozzens and Geo. W. Prankard, of New York The offices will be located here and the mill at Alliance.

Rhode Island, Providence. The Wilkins' Silk Company, B. W. Wilkins, proprietor, has recently started operations in new plant established here. Equipment comprises 50 looms and complementary machinery. Dress goods, lining materials and fancy novelties of different qualities, are made. Goods are shipped away for dyeing, etc. Plant has capacity of 5,000 to 6,000 yards per week.

Enlargements and Improvements.

*Connecticut, Mystic. The Rossie Velvet Co. has installed four more looms in the mills and will soon have them in operation.

Connecticut, So. Manchester. Three new motors have recently been installed in the spinning department of Cheney Bros.' mill. The large pulleys have been removed.

Connecticut, Willimantic. The Windham Silk Company, which has started up ten additional looms during the past month, have placed orders for 26 more, which will soon be received and set up. They make finest grade of black staple weaves, principally gros grains and taffetas.

Maine, Westbrook. The Haskell Silk Co. has installed new finishing machinery in the plant. They now make silks up to forty-two inches in width.

Michigan, Belding. Extensive additions are being made to the Richardson Silk Company's plant.

New Jersey, Paterson. Henry Doherty, of the firm of Doherty & Wadsworth, and also operating 140 looms in the Hall Mill, has leased the greater part of the Hamil & Booth plant, on Railroad Avenue, where about 200 looms will be put in. A complete finishing plant will be installed.

New Jersey, Paterson. The Paragon Silk Company has purchased Kruger & Stohn's silk mill and is removing the machinery to their plant on Straight Street.

New Jersey, West Hoboken. Schwarzenbach, Huber & Co. have recently started operations in their new dye house and will do their own dyeing and finishing. Considerable additional machinery has been installed. The building formerly used for storage purposes has been remodelled for the dyeing purposes.

Pennsylvania, Bradford. Considerable new machinery is being installed in the Leon Silk Mill. About 50 more people will be given employment.

Pennsylvania, Trevorton. The Trevorton Silk Mill contemplates building an addition to the plant. The improvements to be made will more than double the capacity of the plant.

Pennsylvania, Kutztown. The Kutztown Silk Throwing Mills, Hartley Bros., proprietors, have been sold to a New York party, who will install 16,000 new spindles. Thos. E. Palmer, manager of the plant, has severed his connection and will accept a position in Allentown.

MISCELLANEOUS.

New Mills.

Missouri, Kansas City. The Bemis Bros. Bag Co. has leased a building at 1305 West 12th Street, and will establish a branch plant. The necessary machinery is being installed. Henry Allen is manager for the company.

New York, Mechanicsville. The Mechanicsville Fibre Company has been incorporated with capital stock of $2,000 for purpose of manufacturing cotton and woolen fibres and dyeing. Frank G. Ferris, W. A. Robinson and P. F. Cunningham are interested.

Enlargements and Improvements.

Iowa, Dubuque. The Bestoval Mills are planning extensive improvements to the plant. They will manufacture a superior quality of bleached toweling. L. W. Johnson is manager of the plant, which will be put in control of a stock company, in which Mr. D. Farnsworth of New York, will be interested.

Massachusetts, Fall River. Contract has been let for the erection of an addition to the Fall River Bleachery Co.'s plant. The bleach house will be extended by an additional building, 115 by 65 feet, two stories, after plans prepared by Emil C. Arzen, who will supervise work on same.

FIRES.

Maine, Corinna. The two set woolen mill, operated by C. A. Greenwood, has been destroyed by fire. The loss is placed at $20,000, with small insurance. The main building, 3 stories high and dye house, were totally destroyed, the boiler house and picker house being intact. No decision has yet been made about rebuilding, but it is doubtful if it will.

Ontario, Bolton. J. Walshaw's 3 set woolen mill has been destroyed by fire. The loss is estimated at $50,000, partially covered by insurance.

Rhode Island, Wickford. The Oak Hill Mill, of the Wickford Worsted Mills, devoted to manufacture of yarns, has been destroyed by fire. The loss is estimated at $18,000 and partly covered by insurance.

FACTS AND GOSSIP.

Messrs. Keshay & Co., Ahmedabad and India, subscribers to the Textile World, ask if we will advise the trade in America that they are interested in receiving catalogues and information in regard to electrical goods, cotton, woolen and silk fabrics, machinery, etc. We understand that they are importers and commission merchants.

Arkansas, Little Rock. H. L. Hemmel, Max Heiman, John G. Fletcher, George B. Rose and others are interested in forming a company to establish a cotton mill here. They propose having $150,000 invested locally and will obtain $100,000 from outside capitalists.

Canada, Toronto. The Dominion Linen Mills Company has been incorporated with capital stock of $250,000 by C. McEachern, W. B. Weil and D. Grimston. They propose manufacturing linens, cottons and other goods.

*Connecticut, Killingly. The Assawaga Company, recently reported incorporated with capital stock of $75,000, will operate the plant formerly known as the Dayville Woolen Company, at Dayville, Conn. David Gordon is president of the new company; S. F. Jerome, secretary and treasurer and Angus Park, general manager. They will make ladies' wear, such as skirtings, cheviots, etc. Previously the plant was operated on kersey cloths.

Connecticut, Norwalk. Otto Mueller, Jr., of Otto Mueller & Co., Goerlitz, Germany, has been negotiating for purchase of the fair grounds upon which they propose building a silk mill, as an American branch. Company makes a specialty of silk umbrella coverings and tapestry hangings. They contemplate having the plant in operation by September 1st.

Delaware, Wilmington. Messrs. Jos. Bancroft & Sons Co. are extending their system of humidifiers installed by the American Moistening Company, Boston, Mass.

Maine, Rumford Falls. The machinery of the Rumford Falls Woolen Mill, Rumford Falls, Me., has been sold to the Mohawk Woolen Mills, Utica, N. Y. The transaction was negotiated by R. B. Denny, the well known agent for mill property.

Maine, Skowhegan. The Lakeside Mill at East Madison, which has been under lease to the Marston Worsted Company, will continue to be operated by that concern until lease expires, August 1st.

Massachusetts, Fitchburg. The Parkhill Manufacturing Company have placed an order with the American Moistening Company for the extension of their system of humidifiers.

*Massachusetts, Hudson. Although all the machinery has not yet been placed in position, operations have begun in the Hudson Blanket Co.'s mill.

Massachusetts, Medway. Cole & Senior have dissolved partnership by mutual consent. George Singleton of Franklin, Mass., will be associated with Mr. Senior, in carrying on the business as Senior & Singleton.

Massachusetts, North Heath. S. Benson is starting up small plant for making ropes from flax fibres, into halters and other kinds of rope.

Massachusetts, Pittsfield. The weaving department of Helliwell & Co.'s mill has been closed indefinitely.

New Brunswick, Milltown. The St. Croix Cotton Mills have ordered a system of humidifiers from the American Moistening Company, Boston, Mass.

*New Hampshire, Manchester. J. Howard Nichols, treasurer of the Dwight Manufacturing Company, has been elected president of the new Manchester Mills Corporation. Herman F. Straw, agent of the Amoskeag Mills, will also act in same capacity for the Manchester plant, and Harry E. Parker of the Amoskeag plant, has been appointed general superintendent. It is thought that William H. Butler and Henri Shaeffer will retain their places as superintendent of the mills and superintendent of the print works respectively.

New Jersey, Camden. The Camden Wool Stock Company has been incorporated with capital stock of $50,000, by Harry E. Gerhard and John T. Walsh of Philadelphia. They will manufacture and deal in cotton and woolen goods.

New Jersey, Jersey City. The National Silk Mill Co. has been incorporated recently by Albert W. Fitzpatrick, H. B. Brockhurst and Joseph J. Myers. The capital stock is placed at $100,000.

New Jersey, Lodi. The United Piece Dye Works Co. has been incorporated with capital stock of $100,000 by Herman Winbrick (500 Broome St., N. Y.); David Bandler and Harry L. Hass (320 Broadway, N. Y.); Arno Rinck (Lodi) and Robert J. Potter (Paterson, N. J.)

New Jersey, Lodi. The Alexander & Boettger Piece Dye Works have been consolidated recently with the General Piece Dye Works, which has purchased the plant of the Lodi Chemical Co. and will increase the facilities.

New Jersey, Passaic. The Lodi Dry Dyeing Company has been dissolved.

*New Jersey, Trenton. The Alyran Woolen Mills have been incorporated with capital stock of $500,000 by Alfred H. Ryan, recently reported having purchased the mills of the S. K. Wilson estate, David Hastings (Bound Brook) and Howard S. Cornog (Philadelphia).

New York, Albany. The Herrman Woolen Company has filed articles of incorporation, with capital stock placed at $10,000. A. A. Herrman and Charles Herrman (New York) and J. H. Whitbeck (Nutley, N. J.) are interested.

New York, Brooklyn. The Jno. N. Stearns Company have placed a repeat order with the American Moistening Company for the complete equipment of humidifiers for their silk mills.

New York, Cohoes. It has been erroneously reported that the shoddy mills in the "hollow" in Cohoes have been notified to vacate by the Harmony Company. This, however, does not apply to the mill of Wm. Lowenthal & Co., which remains undisturbed in its present location. They have recently added considerable new machinery to their equipment.

New York, Cohoes. The F. W. Kavanaugh Manufacturing Company will dispose of the preparing, carding and spinning machinery and the entire plant devoted to manufacture of balbriggan goods.

*New York, Dryden. The Dryden Woolen Mill, which has been idle nearly all winter, has been incorporated into stock company with capital stock of $150,000. N. D. Doxey (Elmira), James B. Rathborn (Elmira) and D. R. Davenport are among the incorporators. It is thought that the mill will be put in operation May 1st.

New York, Elmira. Messrs. Read & Lovatt have ordered of the American Moistening Company a complete system of humidifiers for their silk mills.

North Carolina, Burlington. Col. Eugene Holt and Jas. N. Williamson are reported as interested in project on foot for building another cotton mill here.

North Carolina, Cumberland. The Cumberland Cotton Mills have adopted the American Moistening Company's system of humidifiers.

North Carolina, Statesville. The Statesville Cotton Mills have adopted the American Moistening Company's system of humidifiers.

*North Carolina, Wilmington. The Willard Bag & Manufacturing Co. will replace the plant recently destroyed by fire, with new building. The loss was fully covered by insurance.

*Ohio, Tiffin. The Tiffin Woolen Mills Company has been incorporated with capital stock of $100,000 by G. F. Goss, R. F. Denison, C. E. Sanders, H. J. Crawford and W. B. Whiting.

*Pennsylvania, Allentown. August A. Fischer is president and superintendent of the Rionor Silk Company recently reported incorporated with capital stock of $100,000 to operate the plant formerly known as the Rionor Silk Mill. Baby ribbons are made and throwing done. Plant is equipped with 8,000 spindles.

Pennsylvania, Easton. The Easton Silk Co. has been incorporated with capital stock of $25,000.

Pennsylvania, Philadelphia. Nathan L. Jones, J. E. Foering and William E. Shappell have made application for a charter for the Philadelphia Axminster Carpet Co.

Pennsylvania, Philadelphia. The Waverly Worsted Company's plant will hereafter be operated by William Dewhirst & Sons.

Pennsylvania, Philadelphia. H. Newsome, manufacturer of silk dress goods, has removed the plant to the Burlington Silk Mfg. Co.'s mill at Burlington, N. J.

Pennsylvania, Philadelphia. Richard Hey & Son's blanket mill at Manayunk, has been closed. It is not known just when operations will be resumed.

Pennsylvania, Philadelphia. The firm of J. Wallworth & Sons has been dissolved on account of death of Jeremiah Wallworth, senior member. A new company has been organized by Joseph, James, Charles and Joseph F. Wallworth, to operate plant as J. Wallwerth's Sons.

Pennsylvania, Sellersville. The Board of Trade is considering a proposition made for establishing a hosiery mill there.

Rhode Island, Lafayette. It is reported that parties have been looking over the Wakefield Mill, of the Rodman Manufacturing Co., for purpose of purchasing same. This plant, which contains four sets cards and 72 looms, has been idle for some time.

*Rhode Island, Woonsocket. Application has been made by Samuel P. Cook and William R. Cordingly, assignees of the Simson & Kirkaldy Co., for authority to sell at private sale all personal property and assets belonging to the estate, on account of failure of the company to pay the creditors 50 per cent. as agreed upon at creditors' meeting held some time ago. They state that they desire to convert assets into cash as soon as possible, but are restrained until suit brought by the Rhode Island Worsted Co. is disposed of.

South Carolina, Anderson. The Cox Manufacturing Company have a placed a third order for humidifiers with the American Moistening Company, Boston, Mass.

South Carolina, Greenville. The Brandon Mills have placed a repeat order for humidifiers with the American Moistening Company, Boston, Mass.

South Carolina, Greenville. Mr. C. E. Graham, President of the Huguenot and Camperdown Mills, has ordered two complete humidifying systems of the American Moistening Company, Boston, Mass.

*South Carolina, McCormick. B. F. Mauldin, of Anderson, S. C., continues to be interested in organizing a company to build a cotton mill here and it is thought that company will be soon perfected. Over $50,000 has been subscribed locally and $75,000 by outside capitalists, leaving about $75,000 more to be secured. A mill of 10,000 spindles and 300 looms is proposed.

South Carolina, Woodruff. The Woodruff Cotton Mills have placed a repeat order for humidifiers with the American Moistening Company, Boston, Mass.

South Carolina, Central. Col. D. K. Norris, of the Norris Cotton Mills, Cateechee, is reported as prime mover in organizing a company to establish a mill here.

South Carolina, Piedmont. It is reported that G. C. McEachern contemplates installing knitting machinery in building and is making investigations concerning same.

Tennessee, Tellico Junction. J. W. Chestnut is reported as trying to organize a company to erect either a knitting mill or cotton mill to make denims.

*Texas, Ferris. The project of establishing a hosiery mill here has been abandoned.

Vermont, Proctorsville. Mr. Burbank's interest in Taft, Burbank & Murdock, has been purchased by H. L. Murdock & Co., who will operate the mill.

Virginia, Dayton. J. H. Ruebush of this place is reported as contemplating establishment of a plant for manufacturing hosiery or underwear, and is soliciting correspondence as regards buildings, machinery, etc.

West Virginia, Clarksburg. The Valentine & Bentley Silk Co., of Newton, N. J., is reported as interested in establishing a silk mill here, but advise us that nothing definite has been done concerning it.

*West Virginia, Morgantown. It is stated that nothing has been done concerning disposition of the Monongahela Textile Company's mill recently reported leased to Philadelphia parties.

Personals.

Cotton.

—Mr. L. T. Houghton, of Worcester, Mass., manufacturer of the Houghton steel thread boards for spinning and twisting frames, expects to visit England about the first of May in the interests of his business. His American orders are now crowding his shop with work, and he has already made shipments to cotton mills in India, and the large number of inquiries that he is receiving from Great Britain and the continent make it necessary that some arrangements should be made to handle the foreign business more conveniently, and while abroad Mr. Houghton expects to make arrangements to this end.

J. A. Andrews has succeeded C. C. Coggins as overseer of spinning at the Greenwood Cotton Mills, Greenwood, S. C. Mr. Andrews was formerly at the Grindel Mill.

L. W. Buck of Concord, N. C., has been engaged as superintendent of the Southern Cotton Mills, Bessemer City, N. C.

J. S. Brown, late of the Hickman Cotton Mill, is the new overseer of weaving at the Cooleemee Cotton Mills, Cooleemee, N. C.

James Brierley, for many years an overseer in the Strong Mill of the Harmony Mills Co., Cohoes, N. Y., has resigned.

Thomas Brierley has succeeded his father, James Brierley, as overseer in the Strong Mill of the Harmony Company at Cohoes, N. Y.

R. C. Bernton is in charge of the slashing room of the Spaulding Cotton Mill, Griffin, Ga.

E. W. Billings has resigned as overseer of spinning, spooling, twisting and the mercerizing of the yarns in the Kennebec Spinning Co., Richmond, Me. Re resigned on account of poor health, and after taking a rest will go to Charlotte, N. C., where he has had a position offered him.

Walter D. Brigham, assistant superintendent of the American Thread Co.'s plant at Willimantic, Conn., has resigned. Mr. Brigham has been connected with the thread works in this city for more than twenty years.

Sidney Coolidge, treasurer of the Stark Mills, Manchester, N. H., has resigned, to accept the treasurership of the Fore River Ship & Engine Company.

James Crabtree, recently of Lawrence, Mass., has been chain beaming at the Hampton Co., Easthampton, Mass., since the first of January.

Eugene Cross, superintendent of the Arlington Cotton Mills, Gastonia, N. C., has accepted the superintendency of the West Point (Miss.) Cotton Mills.

Charles M. Cooke, Jr., has retired from the superintendency of the Bessemer City (N. C.) Southern Cotton Mills, and takes a position with the Union (S. C.) Mills.

John Dimond has resigned as superintendent of the Liberty Silk Mills, Hornellsville, N. Y.

E. W. Emery, dyer at the Connecticut Web Co., Bridgeport, Conn., has resigned.

M. H. Gaynor, for twelve years overseer of carding for the Tremont & Suffolk Mills, Lowell, Mass., has severed his connection with that company.

William R. Gillespie, for two years in charge of a department at the Hampton Co.'s mill, Easthampton, Mass., has resigned, to accept a position in the New York Mills, near Utica, N. Y.

John Gilligan has been appointed superintendent of the Overland Cotton Mill, Denver, Colorado, in place of Mr. Cumnock. Mr. Gilligan comes from the Asheville Cotton Mill, Asheville, N. C.

Arthur M. Herson, superintendent of the weaving department of the Slater Cotton Co., Pawtucket, R. I., has resigned.

Samuel W. Hathaway has resigned as superintendent of the Stafford Mlls, Fall River, Mass. He is succeeded by Timothy Sullivan, who has been superintendent of the Davol Mills for 15 years or more. George W. Wright, overseer of weaving at the No. 5 Iron Works Mills, succeeds Mr. Sullivan at the Davol Mills.

William Howarth, overseer of weaving for the Manville (R. I.) Company, is to be superintendent for the Parker Mills, Warren, R. I.

Walter M. Hastings, manager of the Textile Department at Boston, Mass., of the American School of Correspondence of Chicago, Ill., has accepted the position of assistant superintendent of the Arlington Mills, Lawrence, Mass.

John G. Hall, Upland, Pa., formerly with the Aberfoyle Mfg. Co., Chester, Pa., has received the appointment as superintendent of the Wilmington, Delaware, plant of the Delaware Cotton Company.

Thomas Horrocks, overseer of weaving for the Eclipse Mill, North Adams, Mass., has resigned.

John Kirk, Dover, N. H., has accepted the position of superintendent of weaving for the Slater Cotton Co., Pawtucket, R. I. He succeeds Arthur M. Herson. Mr. Kirk was formerly overseer for the Newmarket (N. H.) Manufacturing Co., and for many years was connected with the Grinnell Mills of New Bedford.

George M. Lane has become superintendent of the Boscawen Mills, Penacook, N. H.

William McDonald has resigned as overseer of the spinning department of the Renfrew Mfg. Co., Maple Grove, Mass., and is succeeded by Thomas Minnahan of Maple Grove, who has been in the employ of the company for some years.

Hector McConnell, for five years superintendent of the Uncasville Mfg. Co., Versailles, Conn., has resigned. Thomas Speakman, formerly overseer of spinning for the Shetucket Co., Norwich, succeeds him.

F. M. Messenger, agent of the Grosvenordale Cotton Mills at North Grosvenordale, Conn., has resigned.

R. K. Matthews has resigned as superintendent of the Worth Mfg. Co., Worthville, N. C., to become superintendent of the Arlington Cotton Mills at Gastonia, N. C.

Peter Murphy has resigned as second foreman of the printing room at the Arnold Print Works, and will take charge of the printing room of the Clyde Print Works, at River Point, R. I.

W. T. Norris, overseer of spinning at the Pepperton Mills, Jackson, Ga., resigned recently.

T. G. Pruitt has entered upon his new duties as overseer of spinning at the Phoenix Cotton Mills, Nashville, Tenn.

Daniel W. Perry has been appointed paymaster of the Nashua Cotton Mills, Nashua, N. H., succeeding the late Webster P. Hussey. Mr. Perry has been assistant paymaster under Mr. Hussey for many years, and during Mr. Hussey's illness, he was in charge of the duties of this office. George H. Dane, clerk in the office, was appointed assistant paymaster in Mr. Perry's place.

Alfred Pate, overseer of slashing, warping and spooling and designer at the Willimantic Cotton Mills Corporation, Willimantic, Conn., has been made overseer of weaving and designer at the mills.

Albert Parkinson, overseer of spinning at the Williamsville Co., Killingly, Conn., has resigned.

John Quirk, who had charge of the finishing department in the Cocheco Print Works, Dover, N. H., for the past year, severed his connection with the company and returned to Lowell.

Herman F. Straw has been appointed general agent of the Manchester (N. H.) Mills. Mr. Straw is agent of the Amoskeag Corporation, also of Manchester, and will continue to hold that position. Col. Harry E. Parker, superintendent of the Amoskeag, has been appointed general superintendent of the Manchester Mills. E. C. Lambert succeeds Mr. Parker and will have special charge of carding and spinning. W. Parker Straw will be superintendent of the dressing and weaving department.

William Sentell, section hand in mill No. 2 of the Clifton Cotton Mills, Clifton, S. C., has been made overseer of weaving with the Easley Cotton Mills, Easley, S. C.

C. L. Strolls, from the South, is overseer of carding at Taunton, Mass.

Frank D. Sawtelle has been promoted from overseer of spinning to superintendent at the Danielsonville Cotton Co., Danielson, Conn.

William Sawyer, designer at the West Boylston Mfg. Co., Easthampton, Mass., has resigned, and taken a position at Passaic, N. J.

Gordon Thatcher, of Middleboro, has been selected as assistant superintendent of the Fall River (Mass.) Bleachery.

Peter Trahan, secondhand, has been appointed overseer of weaving for the Manville (R. I.) Company, succeeding William Howard, who has gone to Warren, R. I.

A. Thompson, after 18 years' service as loom fixer at the Arlington Mills, Lawrence, Mass., has resigned.

William Thompson has resigned as overseer of weaving at the Stevens Linen Works, Webster, Mass.

Lewis White has accepted the position of salesman with C. Bischoff & Co., in Southern territory, and will make his headquarters at Henderson, N. C. Mr. White is a dyer and chemist of much practical experience, and is familiar with Southern trade, having had charge of dyeing in a number of Southern mills.

Edmund Williams, formerly of the Charlotte, N. C., mill, has been made overseer of the cloth

room at the Orient Cotton Mills, same place. He succeeds J. W. Bond, who resigned to accept a like position with the Dover Mill at Pineville, N. C.

T. C. Wilson, who resigned the superintendency of the Gastonia Cotton Mill, Gastonia, N. C., has accepted the position of overseer of carding and spinning in the Cannon Mill, Concord, N. C.

Woolen.

Thomas E. Ainley, overseer of carding for the Haile & Frost Mfg. Co., Hinsdale, N. H., has resigned, and accepted a similar position with George Hinchliffe & Son, Clayville, N. Y.

Charles J. Bankard of Rochester, N. H., has been appointed assistant superintendent of the Pondicherry Woolen Mills, Bridgton, Maine.

George N. Biddles, recently boss finisher for the Pawcatuck Woolen Co., Westerly, R. I., has accepted a similar position with George Hinchliffe & Son, Clayville, N. Y.

William Burwood has been appointed overseer of spinning with the Clinton Mills Co., Norwich, Conn.

E. F. Badmington has been promoted to superintendent of the American Mills Co., Rockville, Conn., to succeed George Schofield, resigned to enter the employ of the American Woolen Co. at Fitchburg, Mass.

J. A. Carson has concluded his services as boss finisher at the Ray Mills of the American Woolen Company, Franklin, Mass.

George J. Dunn, late of South Framingham, Mass., has accepted charge of drawing at the Tingue Mfg. Co., Seymour, Conn.

James Dewhurst, after a continuous service of 43 years with the Groveland (Mass.) Mills, has resigned his position in charge of the wool sorting.

L. M. Dillon, designer at the Fern Rock Woolen Mills, Philadelphia, has resigned to accept a position with the American Mills Co., Rockville, Conn.

William Fairhurst has recently taken a position as overseer of drawing with Wm. Dewhirst Son & Co.'s mill, Manayunk, Pa. Previous to coming here, Mr. Fairhurst was with the Imperial Worsted Co. at East Manayunk.

B. S. Foulds of Auburn, N. Y., succeeds John R. McGregor as boss finisher for the St. Mary (O.) Woolen Mfg. Co. Mr. McGregor resigned in order to accept a similar position with the Orr Felt & Blanket Co., Piqua, O.

James Goode has resigned as superintendent at the Ray Mill, Franklin, Mass.

Jonathan Harley, formerly with the River Spinning Co., Woonsocket, R. I., is overseer of dyeing for the Seneca Falls (N. Y.) Woolen Company.

P. F. Hanlon, boss finisher for W. E. Hayward Woolen Co., East Douglas, Mass., has resigned.

D. W. Hagar is the successor of K. Mahon, boss finisher at the Taylor Mfg. Co., Hope Valley, R. I.

John Leiper, superintendent of the Fitchburg (Mass.) Mill of the American Woolen Co., has resigned. James Corcoran, Providence, is his successor.

James E. Leach has resigned as overseer of spinning at the Glen Woolen Mills, Norwich, Conn., and returned to North Andover, Mass.

John T. McCormack has succeeded F. J. Sheehan as overseer of carding at the Madison Woolen Mills, Madison, Me.

H. S. Mowry, for many years in charge of the finishing department of the Empire Woolen Co., Clayville, N. Y., has resigned, to accept a position in Rockville, Conn.

James M. Morton, assistant superintendent of the Vassalboro Mills, North Vassalboro, Me., has resigned.

William McCorkell is now overseer of spinning for William Dewhirst, Son & Co., Manayunk, Pa.

T. J. Nevins, formerly with the West Conshohocken Woolen Mills, has accepted the position of boss weaver with the Oakland Mfg. Co., Sykesville, Md.

Edward Pray, boss dyer at the Sawyer Woolen Mills, Dover, N. H., has resigned.

W. H. Reddick, of the firm of Andrews & Reddick, Dalton, Mass., has been appointed superintendent of the Clinton Woolen Mills, Clinton, Mich., succeeding Mr. Parker, who had been for eight years or more superintendent of that mill, and now is general manager for the South Bend Woolen Co., South Bend, Ind.

T. J. Sheehan, overseer of carding in the Madison (Me.) Woolen Mills, has resigned, and will re-engage in woolen manufacturing at North Grey, Me., where his former plant was destroyed by fire. John T. McCormack has taken his position at Madison. Mr. McCormack has been carder for seventeen years in the mills of Robert Bleakie & Co. at Hyde Park, Mass. He was presented with a gold ring upon severing his connection.

David F. Stewart, formerly second hand of dyeing for Robert Bleakie Co., Hyde Park, Mass., has gone to Albuquerque, New Mexico, to accept the position of overseer in the Albuquerque Woolen Mills.

William K. Sharp, for many years boss wool sorter and wool buyer for the Sawyer Woolen Mills, Dover, N. H., has resigned.

Edward Slugg, overseer of finishing, is now with the Saranac Mills, Blackstone, Mass.

E. M. Sinclair has resigned as agent of the Cocheco Woolen Mills, East Rochester, N. H.

Edward Sheehy has resigned as overseer of spinning for Adler & Co., Cincinnati, O., and taken the position of overseer of twistng, spooling, spinning and reeling at the Clermont Woolen Mills, New Richmond, O.

George Schofield has resigned as superintendent of the American Mill, Rockville, Conn., to accept a position with the American Woolen Co. at Fitchburg, Mass.

Deaths.

Capt. E. M. Shaw, of Nashua, N. H., who recently died at Kensington, N. H., was for many years prominent in textile circles. He began his mill life as a boy in New Hampshire. Over 40 years ago he went to the Bates Mill, Lewiston, Me., as an overseer. From there he went to Lisbon, Me., as agent of the Farwell Mills, next to Great Falls, N. H., as agent, and finally to Nashua, N. H., as agent of the Nashua Mfg. Co., from which position he retired nine years ago.

F. W. Lawrence, a director of the Ipswich (Mass.) Mills, of the Merrimac Chemical Co., Brookline Gaslight Co., and president of the Globe Gaslight Co., died recently at his home in Brookline, Mass. The deceased was prominent in the advancement of various charitable and educational organizations and movements for the relief of the poor and suffering.

Maurice Browning, aged 93 years, senior member of the late firm of Browning Bros., Camden, N. J., dye manufacturers, died recently.

Webster Knickerbocker died at Hartford (Conn.) Hospital, March 12. He was buyer of cotton goods for C. S. Hills & Co., and also interested in the publication of the "Pocket Guide." His home was in Staffordville, N. Y.

Joseph L. Frame, a well-known linen importer, died March 10 at his home in New York City. Mr. Frame was 36 years of age, and had been connected with the linen trade from boyhood. In 1898 he became a member of the firm of Shaw, Peck & Frame, the style of the firm being changed at that time. Mr. Frame remained a member of the firm until 1901, when the partnership was dissolved and he went into business for himself.

Major A. J. Randall, a well known cotton mill man in the South, died in Griffin, Ga., recently. He had served as superintendent of cotton mills in Canada, New York, Alabama and Georgia.

Newton Earle died at his summer home in Mechanic Falls, Me. He was a native of this town, but for many years his home had been in Providence, R. I Mr. Earle was interested in woolen mills and dye works in Rhode Island, and did a large business in furnishing drugs to dyehouses and mill supplies.

Jeremiah Wallworth, aged 83, Upland, Pa., manufacturer of shoddies, died recently. The deceased was born in Stockport, England, and came to this country in 1842. He started a shoddy mill in West Philadelphia which he operated for some time In 1879 he built a shoddy plant at Upland.

Henry C. Fuller, a well known man in the woolen industry in Maine, died at the Boston City Hospital March 12. He was president and general manager of the Linn Woolen Co., Hartland, Me., and treasurer of the Newport Woolen Co. of Newport. News of his demise was received with general regret.

Milton M. Stone, superintendent of the Edwards Manufacturing Co., Augusta, Me., died recently. Mr. Stone was born in Augusta, January 12, 1834. In 1884 he was appointed agent of the Riverside Mill at Hallowell, where he remained until April, 1890, when he was chosen superintendent of the Edwards Mill, a position which he had since held.

Foster Black of Foster Black & Co., proprietors of the Chesapeake Knitting Mills and the Elizabeth Knitting Mills of Berkeley, Va., died recently. Mr. Black was a North Ireland man, about 55 years old. When he first came to this country he engaged in the linen business, later in the hosiery commission business, and about twelve years ago Mr. Black commenced the manufacture of underwear, at Berkeley, which he had since continued.

Charles Schofield, a brother of the late Seville and John S. Schofield, died at Falls of Schuylkill, Philadelphia, early last month. He came to this country with his father, John Schofield, in 1845, and settled in Manayunk, engaging in the manufacture of shoddies, cloth and blankets on the site of the present Imperial Woolen Mills.

Isaac W. Smith, who has been engaged in business in Bridgeport, Pa., as a manufacturer of men's woolen and cotton goods for the past 20 years, died March 5, from a complication of diseases. He was 63 years old. His three sons have for a number of years assisted in running the mill and will continue to operate it.

Samuel West, a prominent and successful hosiery manufacturer of Germantown, Pa., died recently. Mr. West had been in poor health for the past year and a half. He was 62 years old.

Warren B. Smith, who for a number of years was at the head of the Alexander Smith & Sons Carpet Company of Yonkers, N. Y., died recently, near Tunis, Africa, where he was traveling for his health. He was the son of Alexander Smith, who was the founder of the carpet company and who made it one of the largest in the country. He resigned from the presidency of the company in 1895.

The following statement has been issued by the Draper Company:

"The directors of the Draper Company deem it fitting to have inscribed in their permanent records the following statements, called forth by the death of their late fellow member, Charles M. Day.

"Mr. Day became an employee of the Hopedale Machine Company (one of the companies merged into the Draper Company at its formation), in his youth. He served a three years' apprenticeship. Afterwards he worked in several shops, notably in the Pratt & Whitney shops of Hartford, Ct., and the Brown & Sharpe shops at Providence, R. I., and returning here, became foreman of the tool-making department. He later became foreman of the spindle-making department (then the most important department in the company's works) and was still later appointed superintendent. On the formation of the Draper Company he was appointed General Superintendent, which position he held until the time of his death; and was also a member of the board of directors of the company. He has filled every position referred to, to the entire satisfaction of his employers and associates.

"Mr. Day's connection with the board of directors was a more intimate one than that of mere business relations. He was a friend of every member of the board, and an associate of whom we were all proud. He was an honest, able, strong man. In his death we feel that we have met a personal as well as a business loss."

New Publications.

Knitting, Part 1; by M. A. Metcalf; American School of Correspondence, Chicago, Ill.

This is an instruction paper to be used in the textile course of the above named school. The author has had a long experience with knitting machinery and processes, and is, therefore, well qualified to write such a treatise as this. This instalment treats particularly of cylinder spring needle knitting and is to be followed by other parts to complete the series, which is intended to cover all branches of knitting. In this first part the subject is treated clearly and methodically, one valuable feature being the numerous illustrations which aid greatly to a clear understanding of the subject matter. Many useful yarn tables are also included.

Cotton Manufacturing, Part 1; by E. A. Posselt, price $3.00.

This is a work of 186 pages treating on the preparatory processes of cotton manufacturing including carding. It is freely illustrated and after the opening chapters which treat of the cotton fibre and particular cotton districts of the world, we find the following subjects considered in detail in the order named: Cotton Cleaner Roller Gin; Saw Gin; Round Bales; Roller Bale Breaker; Comber Bale Breaker; Mixing and Picking; Hopper Feed; Lowry Round Bale; Scutchers; Carding.

The purpose of this work is to give the reader a practical idea of the various operations of converting cotton into manufactured goods. The reading matter and illustrations have been prepared with care and the work is confined to the American types of machines, a feature that will be appreciated at the present time when so many of our technical works deal with English machinery exclusively. The illustrations and reading matter are indexed separately, allowing quick reference to any subject desired.

Succeeding volumes are to deal with subsequent processes of manufacturing cotton yarn and cloth as follows: Combing, Drawing and Fly Frames; Mule, Ring Frame, Winding, Doubling and Yarn Preparing Machinery; Designing and Weaving Calculations; Dyeing and Finishing.

Principles of Dyeing; G. S. Fraps, Ph. D., Assistant Professor of Chemistry at North Carolina College of Agriculture and Mechanic Arts; The Macmillan Co., New York; price $1.60.

The chief merits of this, the latest of numerous works on dyeing, is its convenient form and the selection of a type which makes the different divisions of the subject very plain. It is intended mainly for the use of students and has evidently been carefully written, although the small compass of the work has made it impossible to do more than refer briefly to many of the important branches of the art of dyeing. The arrangement of the chapters is somewhat objectionable. The work begins with a description of dyestuffs and is followed by a treatise on the structure and composition of fibres; this appears to be a reversal of the natural order.

The A B C of Photo-Micrography; by W. H. Walmsley; 155 pages; Tennant & Ward, New York; price $1.25.

The author was led to write this book by reason of the lack of any work dealing with this branch of photography. The subject is thoroughly handled and the illustrations add much to the value of the manual which will prove of great help to beginners.

Bulletin of the National Association of Wool Manufacturers, March, 1903; Boston, Mass.

This issue begins with an article by the editor, S. N. D. North, entitled The Reciprocal Interests of Wool Growers and Wool Manufacturers, and is followed by: The Arts of Weaving and Spinning; Report of the Thirty-Eighth Annual Meeting of the National Association of Wool Manufacturers; Annual Report of the Secretary; Obituary Notices; Editorial and Industrial Miscellany; Comparative Statement of Imports of Wool and Woolens—Calendar Years 1901-1902; Imports of Wool Manufacturers, 1902; Quarterly Report of the Boston Wool Market.

A Graphic Method for Solving Certain Questions in Arithmetic or Algebra; by George L. Vose, Professor of Civil Engineering in Bowdoin College, author of Manual for Railroad Engineers; D. Van Nostrand Company; price 50 cents.

This is the second edition of a work that is included in the Van Nostrand Science Series. It explains a method which, although not new, is used to but a comparatively slight extent, and is doubtless capable of extensive application in industrial calculations.

Dockham's American Trade Reports of the Textile Manufacture and Dry Goods Trade, 1903; C. A. Dockham & Co., Boston, Mass. Price $6.00.

This well known directory of the textile trade is now in its thirty-seventh year, the present being the nineteenth edition. The trade are too well acquainted with "Dockham's" for any extended notice to be necessary in this place. The general plan of the work in previous years has been retained and the list of textile manufacturers and dealers brought to date. It contains all the features of previous editions.

Sericulture and Silk Reeling in Hungary; Franklin Society.

All efforts to raise silk in Hungary from the beginning of the 18th century down to 1880 proved failures, and in 1870 the industry had disappeared from the country. About 1880 the Hungarian government resolved to make another effort and with the experience gained in many years of fruitless effort as a guide, entrusted the work to a single individual, giving him full liberty of action. The results have been fairly satisfactory although not equal to the early expectations. The production of Hungarian raw silk has grown from nothing in 1879 to 103,000 pounds in 1901, there having been about 100,000 breeders engaged in the work in the last-named year. The development of this industry is the subject of a pamphlet issued by the Franklin Society and illustrated by many interior views of cocoon houses and filatures. It gives much information of value to those who are experimenting with silk raising in this country.

Business Literature.

Inspection Trip of Civil Engineers; Joseph Dixon Crucible Co., Jersey City, N. J.

This booklet is a souvenir of an inspection trip made by a society of civil engineers to the new terminal of the North German Lloyd Steamship Co., Hoboken, N. J., and contains several very interesting views of the terminal on which the protective paint, manufactured by the Joseph Dixon Crucible Co., has been used.

Modern Engineering Practice; American School of Correspondence; Chicago, Ill.

A pamphlet calling attention to a series of ten volumes treating of modern engineering practice. Following are the subjects treated in the different volumes: Mathematics; Mechanics; Heat; Foundry; Forge; Machine Shop; Machine Design; Boilers; Chemistry; Metallurgy; Engines; Marine and Locomotive Work; Electricity; Generators; Motors; Light; Power; Heating; Ventilating; Plumbing; Mechanical Drawing.

New Knowledge on Belt Management; Cling-Surface Manufacturing Co., Buffalo, N. Y.

This is an attractive and well bound book containing a great deal of useful information regarding the care and use of belting, and is intended to present to the trade an idea of the many advantages to be obtained by the use of Cling-Surface on belts. The claims are so strong as naturally to excite scepticism in the mind of one who has never used this preparation for belting, but this feeling of doubt is removed by the numerous letters from satisfied users of Cling-Surface in all parts of the country. Following these testimonials are a number of photographs with belts in operation which have been treated with Cling-Surface. This latter feature speaks volumes for the material and must be seen to be appreciated. We advise all users of belting to secure a copy of this book.

Cypress Tanks, Tubs and Vats. G. M. Davis & Son, Palatka, Florida.

The durability of cypress is well known and nowhere more marked than in the manufacture of tanks. This is explained by the fact that cypress is in its natural element when in contact with water. The firm of G. M. Davis make a specialty of tanks and vats and are prepared to supply them made from cypress or other material as desired. Parties in need of such appliances will do well to correspond with them before placing orders.

New Calendars.

Wilson & Silsby, Sailmakers, Boston, Mass.

A calendar attached to sensitized sail cloth on which are printed photographs of the yachts Quisetta and Vavahoe. The general design is attractive and very appropriate as coming from sailmakers.

Boyd's Patent Swing-Rail Worsted Spinning Frames.

Worsted yarn manufacturers will be much interested in tests recently made to determine the merits of the swing-rail worsted spinning frame built by J. & T. Boyd, Glasgow, Scotland, and for which Speed and Stephenson, 170 Summer St., Boston, are the American agents. The frames tested for horse power were:

One Boyd's patent swing-rail cap spinning frame, 256 spindles; speed, 6,000 revolutions; pitch, 38 1/2 inches; swing-rail tension. One ordinary cap frame, pitch 3 3/8 inches; 260 spindles; speed, 6,085; spindles driven by tapes and tension pulleys. Both frames were tested on the same yarn and under the same conditions. The Messrs. Boyd took no part in making the tests.

(Copy of certified power test):—"Boyd's frame: 3.56 H. P. or 69.9 spindles per H. P.; ordinary frame: 4.78 H. P. or 54.3 spindles per H. P."; showing that with the swing-rail 28,72 per cent. more spindles are driven for the same H. P.

(Test of regularity of spindle driving):—Boyd's frame: Cylinder 10 inches, 516 revolutions; wharve and band 7/8 inches, calculated and (practically) actual spindle speed on both sides, 5,897 revolutions; ordinary frame: Cylinder 11 inches, 444 revolutions; wharve 3/4 inches, calculated speed, 6,512; actual speed on side A, 5,600 (slippage, 900 per minute); actual speed on side B, 5,200 (slippage, 1,300 per minute); showing a constant difference between sides A and B of 400 revolutions per minute.

Side A has the tape pulled direct from wharve to cylinder.

Side B has the tape pulled round the tension pulley and the adjacent spindle.

Side A has a brake pull of 21 ounces and side B of 13 1/2 ounces.

From the results of these tests J. & T. Boyd feel warranted in claiming that the saving in power alone will amount to 12 per cent. of the extra cost of these swing-rail frames, also a very much better spin on account of the more regular drive and absence of vibration. Five swing-rail frames can be placed on the same floor space now occupied by four of the ordinary frames.

English Views on the Cotton Industry.

At a meeting of the English cotton manufacturers held last month (February) in Manchester, views were expressed by the speakers regarding the prospects of the industry whose products form one-quarter of England's whole export trade. The following from the proceedings will prove interesting, particularly as it gives the opinion of two recent English visitors to the United States regarding our own cotton industry.

On the motion of Alfred Emmott, M. P., seconded by Sir W. H. Holland, M. P., a resolution was passed stating that, in view of the frequent disorganization and consequent loss to the cotton trade of the United Kingdom owing to the uncertain supply of the raw material, it had become necessary to use every effort to increase the growth of cotton. Mr. Emmott said there was a tendency to shortage in the supply of cotton, and the result was short time in working or the actual stoppage of mills.

Mr. T. Ashton, secretary of the Oldham Operative Cotton Spinners' Association, said the workers in the cotton trade looked upon this question as vital. The shortage of cotton had become a source

of trouble in the past. In Oldham alone, in one year, the funds of the operatives' society had been drawn upon to the extent of $75,000 for the support of its members through mills stopping or working short time.

The year just ended had been almost as bad, for they had had to pay $50,000 in the shape of out-of-work pay—not because of bad trade, but because of mills working short time on account of a want of cotton. That being the case, he appealed to all sections of workers, and to everyone who was in any way dependent on the success of the cotton trade, to support this movement and help to make Lancashire less dependent on America for its supply of raw material.

When he was in America lately he found that not a few people there regarded Lancashire as doomed, so far as the cotton trade was concerned. Of course a good deal of that sort of talk was "bounce," but all the same it behooved us to look ahead and prepare for the time when America came near the consummation of her desire—to consume all her cotton in her own dominions.—(Cheers.)

D. J. Shackleton, M. P., concurred with Mr. Ashton's remarks. So far as the weavers were concerned, he, as their representative, could promise their assistance to the association. He could say the same for the card-room operatives, whose representative was Mr. Mullin. If spinning was slack, his trade was slack.

There was another evil they had suffered from for many years, namely, poor quality. They might rest assured that if the American was going to take his own cotton, he would take the best of it. He commended the question to the operatives of Lancashire very sincerely, and thought they might do more for it than they had done. The general public were also interested, and when they read the account of that meeting, they would recognize the seriousness of the question.

An Exceptional Record.

The Diamond Drill & Machine Co., of Birdsboro, Pa., ran the initial heat of their new steel casting plant on March 7th without a single hitch or blunder; every pound of melted iron was poured into castings, and every casting came out perfect—not a flaw or defect of any character in any single casting. They expect to run at least one heat a day every day continuously from now on, and are therefore in a position to make immediate and prompt delivery of steel castings.

Considering the numerous difficulties encountered, in having their entire foundry destroyed in June, 1902, in which they lost valuable patents, we think the Diamond Drill & Machine Co. have just cause for congratulation upon the promptness with which they are at present able to supply their steel castings, as well as upon the demonstrated quality of the same.

Wishes to Buy Worsted Cloth.

The Combination Rubber & Belting Co., of Bloomfield, N. J., advise us that they are open to purchase large quantities of worsted cloth, said cloth to be of very hard, twisted, low grade yarn, very closely woven.

Frank B. Kenney.

The T. C. Entwistle Company of Lowell, Mass., builders of patent warping, balling and beaming machines, card grinders and expansion combs, have engaged Mr. Frank B. Kenney, formerly of the Kitson Machine Co., to manage their business, succeeding the late T. C. Entwistle. Mr. Kenney is one of the most widely known and popular machinery representatives who visit the mills and his long and faithful service with the Kitson Machine Co. has given him a wide experience, which will enable him to fill the duties of his new position with credit to himself and benefit to the company, and his many friends are congratulating both him and the Entwistle Company on this new connection.

"A Portfolio of Rare Views."

Thirty-three magnificent reproductions of photographic views of various scenes along the Fitchburg Division of the Boston & Maine Railroad is what the new portfolio consists of. The delightful panoramic scenery of the Hoosac country and Deerfield valley, the dashing waterfalls and towering mountains are all aptly portrayed in this new addition to the Boston & Maine's Art Library.

This book is entitled "The Charles River to the Hudson," and will be mailed to any address upon receipt of six-cents in stamps by the General Passenger Department, Boston & Maine Railroad, Boston.

The complete set consisting of the other five portfolios, and this new one, will be mailed upon receipt of thirty-six cents.

A Change in Location.

The following announcement has been recently made to the trade:

We beg to announce the removal of our Pittsburg offices from 516 Fitzsimmons Building to 607 House Building, corner Smithfield and Water Streets, the change to occur April 1st, 1903. The new offices afford the large increase in space demanded by the steady growth of our business in this section. They are being equipped fully in keeping with the high standard of the building. As heretofore, the Pittsburg district sales will be in charge of Mr. H. D. Wilson, M. E.

Soliciting a continuance of your commands, we are, very truly yours,

Buffalo Forge Company,
Buffalo, N. Y., Main Office and Works.

Atlantic City.

A UNIQUE CITY BY THE SEA.

Atlantic City has no season. It is perennial. It has broken a tradition: that a sea-shore resort is necessarily a summer resort. It took daring and imagination on the part of the first man who decided to spend his winter vacation at a famed summer place, and even more of the same qualities on

the part of the hotel keeper who decided to keep his house open and provide lodgings for whoso might follow in the trail blazed by the daring innovator. The experiment succeeded a decade ago. The Gulf Stream made it so. Geographically, Atlantic City is the most favored resort on the North Atlantic Coast. Its great temperature regulator is the Gulf Stream, which approaches the land nearer at this point than at any other place north of the Carolina coast. Thus the ocean winds that come breezing out of the east are tempered to the winter sojourner and made almost balmy and free from chill.

Put a pipe in your mouth, jam your hands snugly into your pockets, and take a turn along the board walk and notice the crowds. But for the absence of the light summer dresses, duck trousers, and straw hats, it might be a cool morning in early summer. Business men, University of Pennsylvania undergraduates, trim young women in light furs and smart wraps, invalids in roller chairs, convalescents making slow progress on the arm of an attendant—all taking advantage of the invigorating ocean breezes.

There are fun and amusement a-plenty for the person who is seeking recreation and not health. The Casino has an excellent ballroom, and a commodious white marble swimming pool of sea water, warmed to a comfortable temperature for bathing, no matter what the season. There are bowling alleys and sun parlors with commanding views of the ocean and esplanade. Three long ocean piers are additional places of resort and amusement. They are kept comfortably heated when the temperature demands. For the large contingent who devote their time to outdoor sports there are the golf links, of which Harry Vardon, the English champion, spoke so highly. The course is owned by the Country Club, but its courtesies are extended to hotel guests. A well-equipped clubhouse is on the grounds of the club. Fishing is kept up throughout the winter. The Horse Show draws thousands of visitors. To speak of the hotels is hardly necessary. They range from huge structures equipped with every convenience that luxury can command, to quiet villas and boarding houses. They stand to satisfy the vagaries and demands of any applicant.—New York Post.

The New Jersey Central has a double daily service to Atlantic City from New York leaving the latter city from foot of Liberty Street, at 9.40 a. m., 3.40 p. m. Send to C. M. Burt, General Passenger Agent, New York, for illustrated Booklet and Time Table. It's free for the asking.

Griffin Knitting Mills.

A very attractive line of ribbed underwear, made by the Griffin Knitting Mills, Griffin, Ga., is handled by Messrs. Lyon and Sylvester of 68 Essex St., Boston. The goods offered to the trade at $3.75 and $3.85 are of special value; the fabric being firm and elastic and making very sightly garments. An exceptionally well made article in men's ribbed goods is offered to the trade in various colors at $7.50 net. The mills at Griffin are in charge of W. H. Brayton, superintendent, who has been very successful since he assumed his present position.

In addition to the Griffin line, Messrs. Lyon and Sylvester are the New England agents for the well known Wayne Knitting Mills, manufacturers of full fashioned hosiery at Fort Wayne, Indiana.

Roxford Knitting Co.

Their new buildings at Jefferson and Randolph streets, Philadelphia, have recently been occupied by the Roxford Knitting Co. The mill contains 85,000 square feet of floor space and is one of the largest of its kind in the country. A high grade of men's balbriggan underwear is manufactured, and the popularity of the Roxford goods is shown by the steady growth of the mill since it was established in 1891. At that time 4,000 square feet of floor space was occupied; this has been increased steadily, the record being as follows: 1893, 10,000 sq. ft.; 1807, 18,000 sq. ft.; 1901, 25,000 sq. ft.; and now the new buildings contain 85,000 square feet.

Allis-Chalmers Company.

Among the February engine sales of the Allis-Chalmers Company we note the following:

The Bucyrus Company, South Milwaukee, Wis., one 16 by 42, 1890, Frame Reynolds Corliss Engine; Southwestern Missouri Electric Railway Company, Webb City, Mo., one 30 and 60 by 48 Horizontal Cross, Comp. D. C. Reynolds Corliss Engine; Albert Schwill & Co., Chicago, Ill., two 26 by 48, 1890, Frame D. C. Reynolds Corliss Engines; Wausau Paper Company, Brokaw, Wis., one 16 by 36 Girder Frame Reynolds Corliss Engine; Vulcan Iron Works, San Francisco, Cal., one 14 by 36 Girder Frame Reynolds Corliss Engine; Union Electric Light and Power Co., St. Louis, Mo., one 12 by 16 engine; The S. Obermayer Co., Cincinnati, O., one 20 by 48 Girder Frame Reynolds Corliss Engine; George M. Moulton & Co., Chicago, Ill., one 24 and 48 by 48 Steeple Compound Reynolds Corliss Engine; The Javril Company, Battle Creek, Mich., one 12 by 30 Girder Frame Reynolds Corliss Engine; Louisville Railway Company, Louisville, Ky., two 40 and 78 by 60 Vertical Cross Comp. D. C. Reynolds Corliss Engines; James Davidson, West Bay City, Mich., one 16 by 42 Girder Frame Reynolds Corliss Engine; Denison Light and Power Co., Denison, Texas; one 16 by 36, 1890, frame Reynolds Corliss Engine; Albuquerque Gas, Electric Light and Power Co., Albuquerque, N. M., one 16 and 28 by 36 Horizontal Cross Comp. D. C. Reynolds Corliss Engine; Hartwell Brothers, Chicago, Ill., one 16 by 42, 1890, Frame Reynolds Corliss Engine; Chicago File and Rasp Co., Illinois, one second hand 14 by 42 right hand F. & C. Corliss Engine; Denver Engineering Works, Colorado, two single differential electric motor driven Riedler pumps.

—Among the orders recently received by the Burt Mfg. Co., Akron, O., for its famous Cross oil filters are: One fifty gallon for a large electric lighting plant in Mexico City, Mex.; four large ones to be used on steamers now being built by the Eastern Shipbuilding Co.; two for one of the pumping stations in New York City; one for the plane works of the International Harvester Co.; eight for San Francisco, Cal.; one to Portugal; and eighteen to their agent at Mexico, who reports business good.

New York Office.

The Main Belting Company, manufacturers of Leviathan belting for power transmitting, conveying and elevating, announce that it has opened its New York office in the Mutual Reserve Building, 309 Broadway, Room 913, for the prompt despatch of business.

Automatic Sprinklers.

The Walworth Manufacturing Company announces that it has sold out its entire sprinkler department and patents pertaining to same to the Automatic Sprinkler Company, and is no longer in the sprinkler business. The repairs and parts business is also transferred, and the Walworth Company now confines itself to its very wide range of specialties for engineers, steam fitters, plumbers, etc., of which they are among the very largest manufacturers and dealers in this country.

Profit Sharing.

Since 1889 the Bourne Mills, Fall River, Mass., have successfully conducted a plan of sharing profits with their employees. Speaking on the subject the treasurer of the mills, George A. Chase, says: "To give a right flavor, profit sharing should be to employees what dividends are to stockholders, an income not personally earned; an income to be watched for and expected just as the stockholders' dividend is watched for. In an experience of fourteen years under conditions which theorists named 'comparatively unpromising' and offering very little encouragement for the introduction of 'profit sharing,' it is safe to say that the experiment begun in 1889, in Fall River, encountered none of the difficulties which were predicted. From an employer's standpoint, profit sharing should be adapted studiously to the particular situation in hand. Has profit sharing proved profitable? It was demonstrated that it was so for a number of years from the start compared with previous conditions or with competing mills chiefly because it smoothed the way to accept advanced methods, which were shown to be advantageous to employees in direct wages and to the company in costs. The motive of profit sharing is trust in human nature. The advantages on both sides cannot be expressed in figures of values. The measure meted out will be measured back. It will be a great advantage to all when employers and employees come to trust each other with mutual confidence."

Rug Weaving in Asia.

A valuable map of Asia showing the location of the principal rug districts has recently been issued by A. & M. Karagheusian, importers of Oriental rugs and carpets, 19th St. and 4th Ave., New York City. This map is also useful for general reference. With it is given an interesting account of the rug industry in Asia.

—The Pittsburg Steamship Co., controlled by the U. S. Steel Corporation, has ordered a large Cross oil filter from the Burt Mfg. Co., Akron, O., for use on one of its steamers.

The Trade Press.

Trade Press List is a unique publication, of which Robert Mitchell Floyd, 50 Central St., Boston, Mass., is the owner and editor.

It gives a list of technical, trade and class journals of all the different industries, not only in the United States, but all over the world. When we first received a copy of this list, it did not seem as if it would be of much interest and value, but we have since found frequent occasion to consult it, and have found it of value in various ways in referring our own advertisers and subscribers to authorities in other lines outside our own. It seems to us that to general advertisers, using the publications of more than one line of trade, it would be of great value.

We have only one suggestion to make, and that is that Mr. Floyd should in some way endeavor to indicate distinction in the character of circulation of the papers, so that a person who is unfamiliar with an industry might determine which are the leading publications. From inspection of a sample copy it is usually easy to tell by general make-up, character of the reading pages and the volume of advertising in what estimation the journal is held by its own clientage.

It is pretty safe to say that any journal whose reading pages are composed largely of write-ups and puffs has not much of a subscription list. People don't pay for that sort of thing. What they pay for is information or news in regard to their industry. Too many trade papers neglect the subscriber. The publishers forget that they are best serving the interests of their advertising patrons by making a paper that will be subscribed for and read by the people that the advertiser wishes to reach. Trade journalism is undergoing a process of evolution and in every line of industry one or two publications are forging ahead and stand out as the recognized leading and influential journals in its line. The subscription departments of such magazines are conducted in a straightforward business-like fashion. Subscribers are expected to pay promptly or are cut off. The advertising rates are fixed and not a matter of barter, and the editorial and reading pages are governed by a well defined policy uninfluenced by advertising considerations. Such a journal commands the respect of its clientage, and holds both its subscribers and advertisers by giving them an equivalent for their money; rather than through friendship, blackmail or subservient truckling. Such a trade journal is one of the important factors for good of the trade it represents, instead of a leech draining it of all the money it can get.

W. T. Lane & Bro. Removed to Poughkeepsie.

Messrs. W. T. Lane & Brother, manufacturers of Lane's patent canvas mill baskets and other goods of a similar nature, have for a long time been located at Port Chester, N. Y. Their business has so increased during the past year that they were obliged to have a larger factory. They have found at Poughkeepsie, N. Y., just what they have been looking for, and in their new quarters will be better able than ever to care for their expanding business, a large part of which comes from the textile mills.

A Charming Pleasure Place.

Few winter resorts have the equal of Lakewood's advantages which are primarily, location, climate and surroundings. At the end of a ninety minute railroad journey you reach Lakewood, the winter home of fashion, culture and society. Fine roads in several directions lead to the hotels and cottages of the latter, of which there are many, and the life of their occupants is as merry as can be. The climate at Lakewood is at least 10 degrees milder than at New York or Philadelphia, and by its situation in New Jersey's famous pine belt there is an exhilarating healthfulness found nowhere else on the Atlantic Coast. The hotels are metropolitan in every sense and every convenience imaginable is found there, including Sun Parlors, Palm Gardens, Artistic Tea and Music Rooms, and a wonderful appointed cuisine. There are innumerable opportunities for out door life and sports like Pony Polo, Golf, Cross Country Riding, Coaching and Automobiling are indulged in. The only road to Lakewood from New York is the New Jersey Central and its express service is such that many New York business men travel daily between Lakewood and New York. To know about Lakewood write C. M. Burt, G. P. A., New Jersey Central, New York City, for Book on New Jersey's Pines, etc., it's free for the asking.

Seven Thousand Pounds per Week.

The Norwich Processing Co. are putting out about 7,000 lbs. a week, making a specialty of mercerizing yarn in skein. Their supplementary process makes a very brilliant lustre.

Textile Patents.

ISSUED FEB. 24, MAR. 3, 10, 17.

Apparatus for Bleaching Fabrics. 721,436. Victor Floquet and Leonce Bonnet, Reims, France, assignors to William Willans Shaw, Rochdale, England.

The inventors of this machine discovered that one of the principal reasons for the unsatisfactory results in bleaching fabrics with sulfurous-acid gas in a closed vessel from which the air was exhausted, was that the gas was admitted at too great a pressure and not sufficiently gradually. According to this invention the gas instead of being allowed to expand into the vacuum-chamber direct from a high-pressure reservoir or other source is first allowed to expand to about atmospheric pressure into an intermediate vessel, which also serves as a measure, and is then again allowed to expand into the exhausted vessel containing the fabric, so

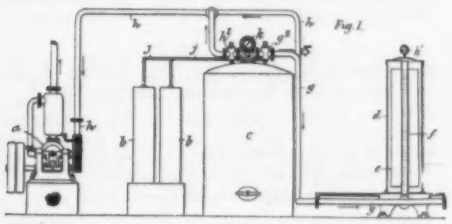


Fig. 1.

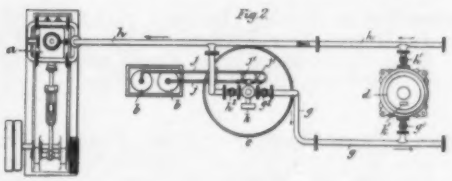


Fig. 2

that the pressure in the latter vessel is less than that of the atmosphere.

Figure 1 is a side elevation, partly in section, of the apparatus employed; and Fig. 2 is a plan.

a is a pump for producing a vacuum.

b b are tubes containing sulfurous acid under pressure.

c is the intermediate vessel.

d is a vessel containing the roll of cloth *e*, wound upon the perforated spindle *f*, which is connected by a pipe *g* and cocks g' g^2 to the vessel *c*. The vessels *c* and *d* are connected to the pump *a* by the pipe *h* and cocks h' h^2. The vessels *b* and *c* are connected by pipes *j* and cocks j'. k k' are pressure-gages on the vessels *c* and *d*.

Cotton Chopper and Cultivator. 723,126. Michael A. Beard, Springhill, La.

Cloth-Cutting Machine. 722,475. Ross P. Wright, Buffalo, N. Y., assignor to Eastman Machine Co., Buffalo, N. Y.

Dye and Making Same. Blue Polyazo. 722,860. Ivan Levinstein and Carl Mensching, Manchester, England, assignors to Levinstein, Ltd., Manchester, England.

Dye and Making Same. Blue Sulfur. 723,154. Richard Herz, Frankfort-on-the Main, Germany, assignor to Leopold Cassella & Co., Frankfort-on-the-Main, Germany.

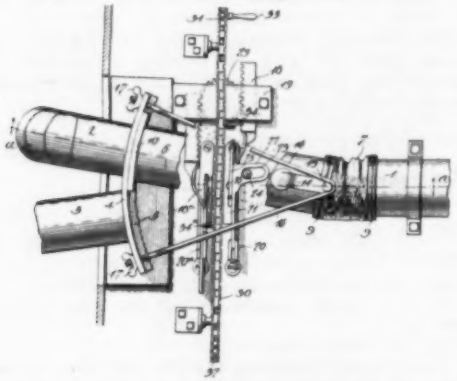
Dye and Making Same. Green Anthracene. 723,125. Oscar Bally, Mannheim, Germany, assignor to Badische Anilin & Soda Fabrik, Ludwigshafen-on-the-Rhine, Germany.

Dye and Making Same. Wool. 722,715. Myrtil Kahn, Elberfeld, Germany, assignor to Farbenfabriken of Elberfeld Co., New York City, N. Y.

Fabrics. Giving Lisle Thread Finish to Vegetable. 723,147. Alexander N. Dubois, Philadelphia, Pa.

Cotton Conveyer. 721,743. George E. Richmond, Houston, Texas.

This invention relates to an improvement in pneumatic cotton-conveyers, particularly with relation to means for putting the exhaust-pipe which leads to the elevator in communication with either of a series of intake-pipes at will and for relieving the partial vacuum caused by the operation of the exhaust-fan at will. The accompanying drawing is a plan view of an apparatus embodying the improvements. In order to shift the switch-pipe, the chain 30 is put in motion, thereby causing one of the tappets thereof to engage the detent of one of



the links, draw the latter, together with the rack-bar to which it is attached, longitudinally, and hence shift the switch-pipe. The length of each of the cam-plates is such that the latter, when the switch-pipe is in communication with one of the intake-pipes, releases the notched shoulder of the link, thereby causing the latter to turn on its pivot sufficiently to release the detent 27 thereof from the engaging tappet of the endless traveling chain.

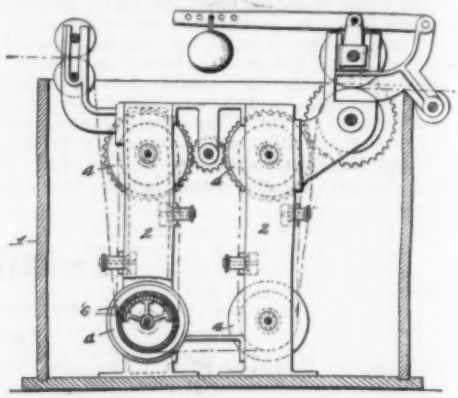
Dye and Making Same. Wool. 722,716. Myrtil Kahn, Elberfeld, Germany, assignor to Farbenfabriken of Elberfeld Co., New York City, N. Y.

Dyeing Machine. 721,630. James A. Willard, Chattanooga, Tennessee, assignor to Vacuum Dyeing Machine Company, Chattanooga, Tenn.

In warps which require a bottom and top color it is necessary to first run it through the bottom color and then through the top color, as in the case with basic colors. By this machine, however, it is necessary, in order to secure proper work, that the warp should be passed through the machine but once.

The numeral 1 indicates a tank or vat of suitable material—such, for example, as wood—which is adapted to receive a solution of dye liquor and several of the rollers. In some cases there may be several of these tanks arranged in series, the warps after they leave one machine being adapted to be brought under the action of the succeeding machine, and so on.

Located within the tank 1 and at opposite sides thereof are the standards or columns 2, it being seen that there are two pairs of these standards and that they are hollow. The hollow columns or standards have widened bases or feet resting on and suitably secured to the bottom of the tank or vat 1, and they are adapted to rotatively support the hollow journals 3 of the hollow rolls 4, it being obvious that the interiors of the co-operating columns and rolls are in communication, so that dye liquor can be forced from the columns into the rolls through the hollow journals of the latter. It will be seen on reference to Fig. 1 that there are



two pairs of superposed rolls. The several rolls are transversely grooved upon their peripheries, as at 5, and in the bottoms of the grooves are formed a multiplicity of perforations 6, through which the dye liquor can be forced.

Fabric Smoothing and Ironing Apparatus. 723,192. George B. Benns, Chicago, Ill., assignor of two-thirds to Willard B. Graves and Frank Mellish, Chicago, Ill.

Loom Filling Feeder, Automatic. 721,784. Edward Cuniff and John V. Cuniff, New Bedford, Mass., assignors to the Draper Co., Hopedale, Mass.

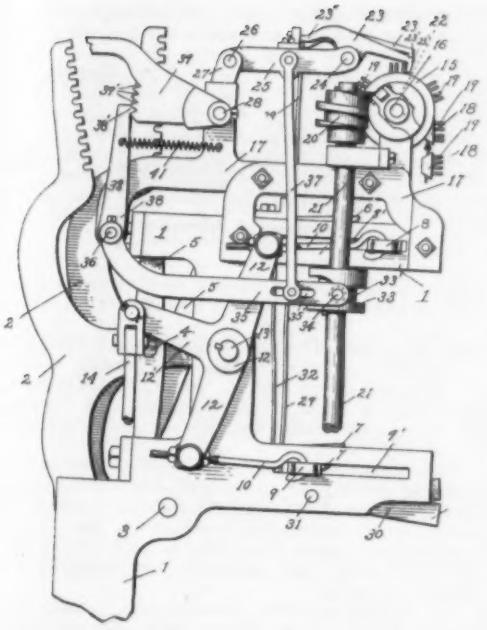
Loom Jacquard Machine. 721,885. Joseph E. Garlick and Walter J. Garlick, Paterson, N. J.

Loom Jacquard Mechanism. 723,153. Harry Hardwick, Philadelphia, Pa., assignor to Ivins, Dietz and Metzger Co., Philadelphia, Pa.

Loom-Shuttle Tension Device. 721,978. Joseph E. Tichon, New Bedford, Mass., assignor to John V. Cuniff, Edward Cuniff and Frederic W. Reynolds of New Bedford, Mass.

Loom Thread-Winding. 721,792. Frank H. Frissell, Middletown, Conn., assignor to the Russell Mfg. Co., Middletown, Conn.

Fibrous Plants. Machine for Defibrating. 722,556. Warren S. Belding, Hackensack, N. J., assignor to Eyssen-Packer Defibrator Co.



Dobby Mechanism for Looms. 720,869. Horace Wyman, Worcester, Mass., assignor to Crompton & Knowles Loom Works, Worcester, Mass.

This invention relates to the dobby mechanism of a loom and its object is to make an improved dobby mechanism and more particularly to combine with an ordinary dobby mechanism supplemental mechanism to produce four different weaves in the fabric. It consists of certain novel features which are termed a "four-weave" motion.

The drawing is a side elevation of a portion of a dobby mechanism with this improvement applied thereto, sufficient to illustrate its construction and operation.

It will be understood that each horizontal row of pattern-pins 19 on the pattern-chain represent one weave, and in case the weave is to be changed the pattern-surfaces 42′ on the pattern-chain 42 will operate the lever 39, move said lever and cause it to rotate the rock-shaft 28, and move it in one direction or the other to change the upright position of the arms 27, carrying the rod 26, on which the frame 25 is hinged, so as to move the frame 25 forward or back to cause the indicator-levers at their engaging ends to be in a position to engage any one of the four rows of pattern-pins 19, as desired. After the lever 39 is moved the arm 38 acts to hold it in its adjusted position.

Loom Warp Stop-Motion. 722,818. Joseph T. Cyr, Worcester, Mass., assignor to Crompton & Knowles Loom Works, Worcester, Mass.

Gin Cotton Cleaner Attachment. 723,035. Mathew Ruth, New Edinburg, Ark.

Looms. Thin-Place Detector Mechanism for. 723,049. Ernest E. Shelters and Henry T. Hunnewell, Lowell, Mass.

Spinning Frame. 722,145. Alonzo E. Rhodes, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

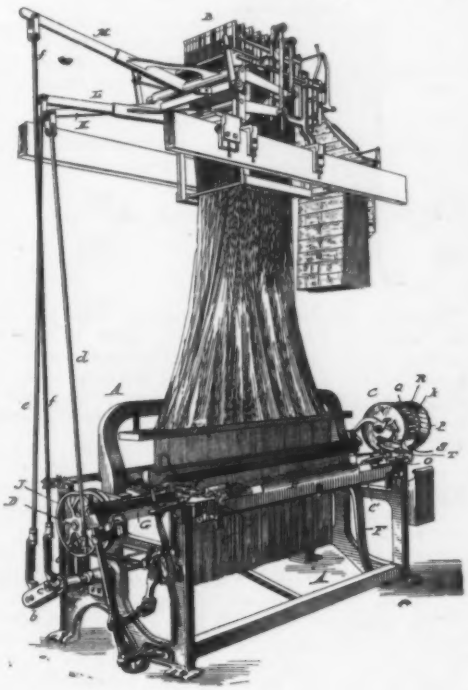
Spinning Machine. 721,684. George H. Ellis, Chicago, Ill.

Textile Material Non-Inflammable. Rendering. 723,088. William Warr, Staleybridge, England.

Power Loom. 722,248. Samuel F. Patterson, Baltimore, Md.

This invention pertains to power-looms; and consists, primarily, in combining with the usual weaving apparatus or loom proper, jacquard mechanism and automatic devices for renewing the filling in the shuttle whenever it becomes exhausted or when the filling thread or yarn breaks.

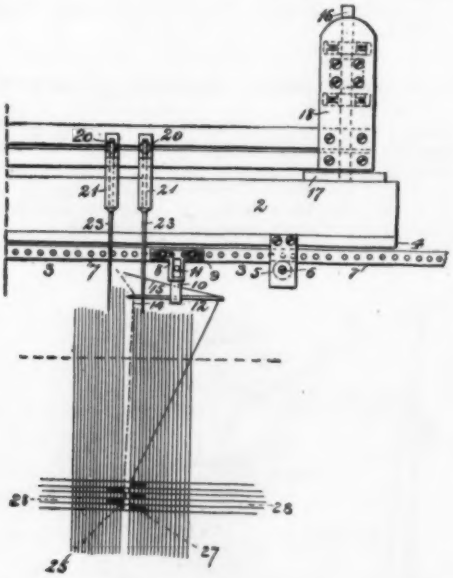
In the drawing A indicates the loom as a whole,



B the jacquard mechanism, and C the automatic bobbin, spindle, or cop feeding mechanism, which constitute the main elements or groups of elements embraced in the novel combination constituting the invention.

Loom. 12,082 (Reissue). William T. P. Hollingsworth, New York, N. Y., assignee of Frederic Barlet, deceased.

This invention relates to an apparatus capable of application to and use in connection with any type of shuttle-loom for the purpose of weaving in the middle of a fabric selvages which will not unravel. This permits the selvages of twin fabrics or ribbons—that is to say, two or more fabrics or ribbons woven simultaneously side by side by the same ground-shuttle—having given to them the same appearance and solidity as the selvages of cloths or ribbons woven separately, the selvages being woven simultaneously with the fabric.



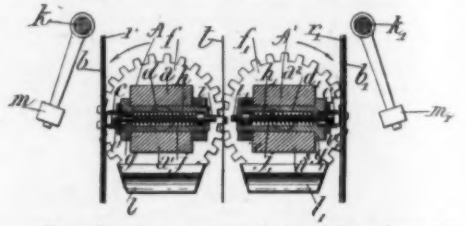
Instead of selvages the apparatus may be used for weaving fancy or figured strips of various widths concurrently and simultaneously with the throw of the ground shuttle or shuttles. The accompanying drawing is a face view of so much of a shuttle-loom as is needed to illustrate the invention.

Twisting Head. 721,527. Albert Taste, Verviers, Belgium, assignor to Societe Anonyme Celestin Martin, Verviers, Belgium.

Ornamenting Cloth. 722,447. Lucien David and Tony David, Lyons, France.

The apparatus to which this invention relates is primarily intended for the simultaneous application of tufts or ornaments of various forms to both faces of a fabric, these tufts or ornaments being cut as required for their application from bands of another fabric.

The fabric *t* to be ornamented—generally muslin, tulle, etc.—is stretched vertically between two similarly-working tool-carriers A A', each cutting and cementing a horizontal row of tufts or ornaments. It is arranged in such manner as to be capable of moving intermittently after each operation the distance separating the rows. The ribbons *r r'*, from which the tufts or ornaments are cut, which are

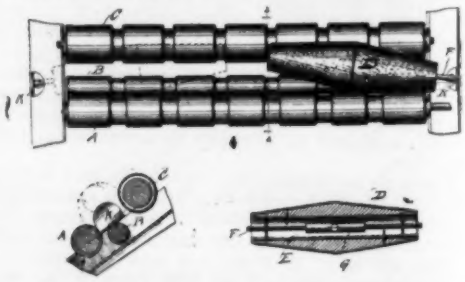


generally velvet, are arranged parallel to the fabric and on the other side of the tool-carriers A A'.

Roll-Cleaning Device for Spinning-Machines. 723,172. Victor Maheu, Willimantic, Conn., assignor of one-half to John B. McCarthy of Franklin, Mass., John O'Connor of Putnam, Conn., and Harry M. Turner of Turnersville, Conn.

This invention relates to an improvement in roll-cleaning devices for spinning machines, the object of which is to produce a cleaning device which will automatically change its position so that it will continuously travel from side to side of the machine and relieve the attendant from watching and taking care of it.

In carrying out this invention use is made of a cleaner D of a double-conical form with the larger ends of the cones together. This cleaner is hollow, as at E, and has extending through it a wire or rod F, which is of greater length than the body of the cleaner. This rod is free to move through the cleaner and has secured to it a weight G. At each side of the frame of the machine appurtenant to the rollers is a stop K.



The operation of the device is readily understood. When the cleaner is tilted in the position shown in the drawing, it is moving across the rolls from left to right, it being held in that position by the weight. It will be seen that the rod F is projecting a little beyond the end of the cleaner. As the cleaner moves still farther to the right it will move up on the rod, which is held against further movement by the plate K. The weight which is secured to the rod passes the centre of the cleaner and tilts it in the opposite direction, and the cleaner will immediately begin to move from right to left with the rod projecting from its left end.

Thread-Guide for Twisters. 721,828. John R. O'Neil of Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

This invention has for its object the production

of a thread-guide particularly adapted for twisters to guide the threads of a set as they pass from the spools on the creel-frame to the delivery-rolls and maintain such threads separated from each other.

It is now the usual practice to collect the several threads of a set in a guide-eye or pigtail back of the rolls, the collected threads passing therefrom in a loose rope or mass to the rolls, and it is extremely difficult for the attendant to readily observe whether or not all of the threads of the

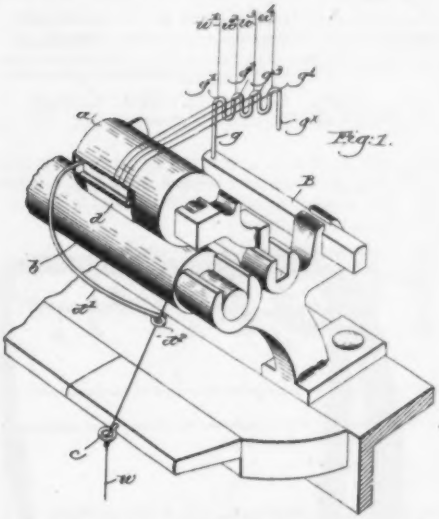


Fig. 1.

set are passing to the rolls. This is not very objectionable when a comparatively large number of threads constitute a set; but when three or four threads are being twisted together the resultant thread is much weaker than it should be if for any length of time less than the entire set enter into its composition.

In the present invention a novel guide is provided which separates from each other the several threads and maintains them separated between the guide and the rolls, so that the attendant can see at a glance whether or not all of the threads of the set are running properly, the guide also causing the threads to be delivered uniformly to the rolls, so that the twist is more uniform.

Tension Device for Loom Shuttles, 721,978. Joseph E. Tichon, New Bedford, Mass., assignor to John V. Cuniff, Edward Cuniff and Frederic W. Reynolds of New Bedford, Mass.

The object of the invention is to provide an automatic threading tension device for loom-shuttles.

Figure 1 is a top view of part of a loom-shuttle and part of a bobbin, showing the weft-thread entering the improved tension device as the shuttle is thrown in the direction indicated by the arrow. Fig. 2 is the same view of part of the shuttle and part of the bobbin as Fig. 1, but shows the weft-thread in its passage around the stem of the tension device. Fig. 3 is a longitudinal sectional view of part of the shuttle, showing the weft-thread extending from the bobbin through the tension device in solid lines and indicating in broken lines the

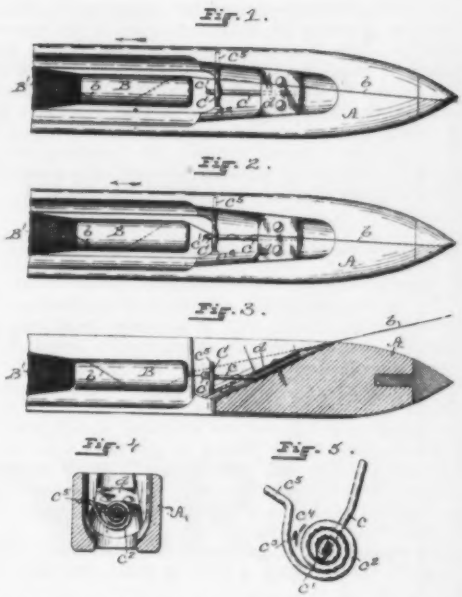


Fig. 1.

Fig. 2.

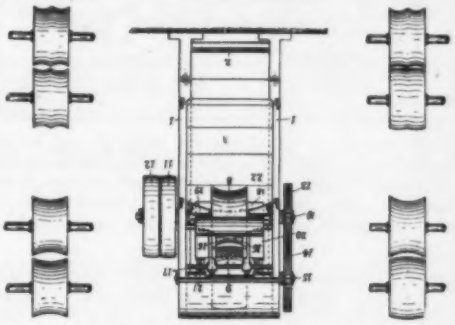
Fig. 3.

Fig. 4.

Fig. 5.

position of the weft-thread as it enters the spiral of the tension device. Fig. 4 is a transverse sectional view of the shuttle, showing the spiral guide of the tension device. Fig. 5 is a perspective view of the tension device.

Fulling Machine. 722,363. Leopold Philipp Hemmer, Aix-la-Chapelle, Germany.



This invention relates to fulling machines, and particularly to those in which instead of cylindrical rollers, rollers with profiled or curved surfaces are employed, the end in view being to concentrate the textile fabric in the central part like a hank, so that it can be better fulled afterward in the direction of its breadth. The last-named fulling operation cannot be executed satisfactorily where the fabric has passed through a fulling-machine with cylindrical rollers, which always cause the fabric to broaden out toward the ends of the rollers. The excessive broadening out of the fabric cannot take place with these new rollers, as the working surface prevents the broadening out of the fabric and concentrates the mass of it more or less in or toward the centre.

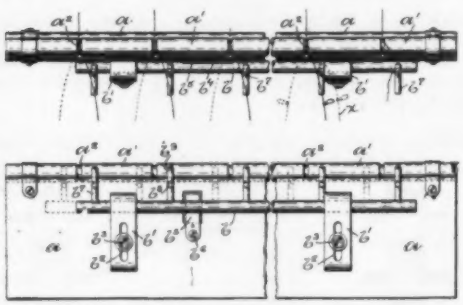
Another advantage gained by these new profiled rollers, is to cause the different layers of the textile fabric to slide one over another and cause the creases of the fabric to change their position as often as the fabric is passing between said rollers, owing to the different circumferential velocities of the working surfaces of the rollers. In consequence of the friction between the different parts of the textile fabric passing through the profiled rollers a better felting of the former is obtained.

Twisting Machine. 722,821. George B. Dennis and Edwin Dennis, Central Falls, Rhode Island.

This improvement has reference to guide-boards of twisting-machines; and it consists in a device under the guide-board to automatically break the thread when a knot or snarl gets in the thread to prevent bunching or uneven winding on the bobbin.

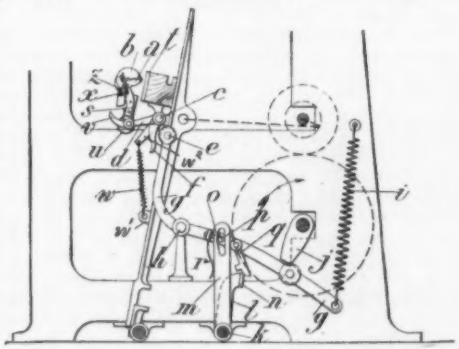
In twisting-machines for twisting spool-cotton or sewing-thread, the thread as it comes from the rolls and goes to the bobbin in the usual way is likely to get snarled or knotted, and if not seen by the operator makes a bunch in the winding or an uneven winding on the bobbin.

The object of this invention is to automatically break the thread when a knot or snarl gets into it,



by the weight of the knot or snarl giving an increased centrifugal force to the thread between the guide-board and the ring-traveler, causing the thread to catch in a wedge-shaped bend in a pin under the guide-board and breaking the thread.

Thread-Parting Mechanism for Weft Replenishing Looms. 722,081. Camille Brun and Gustave Brun, St. Etienne, France, and Jules Bicking, Mulhouse, Germany.



The invention relates to looms for weaving provided with continuous weft feed by automatic replacement of the shuttle. In these looms at the time of replacing the exhausted shuttle the yarn still attached to this shuttle should be cut near the fabric. It is also convenient to cut in the same manner the excess of weft of the new shuttle, but only when one shoot of this weft has been bound in the fabric.

The invention is illustrated in the accompanying drawing which shows a transverse section of the loom, with the mechanism in the position of rest.

Twine. 722,960. George H. Ellis, Chicago, Ill., assignor to Deering Harvester Co., Chicago, Ill.

The object of this invention is more particularly to produce a successful cheap twine for binding grain and similar uses, somewhat coarse and preferably of a single strand.

This twine, consists not merely in a mixture of hard and soft fibres, but may be considered in the nature of a combination of hard and soft fibres, by which the spinning of soft fibres is facilitated and improved, and the spinning of the hard fibres with the soft fibres renders a softer twine than produced from hard fibres and one more uniform than a twine where the soft fibre alone is used. The functions of the hard fibres and of the soft fibres are so modified by being associated with each other that a sliver of medium softness can be produced, and consequently a twine of medium softness, which is desirable, particularly when used for binding grain, as such twine has neither the objection of soft-fibre twine nor twine made from hard fibre.

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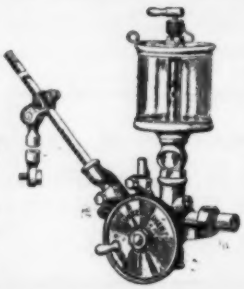

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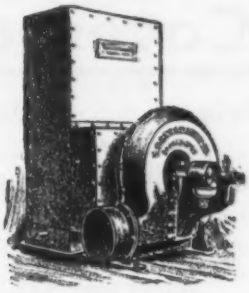

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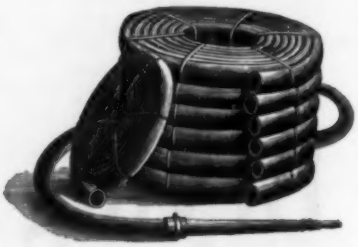

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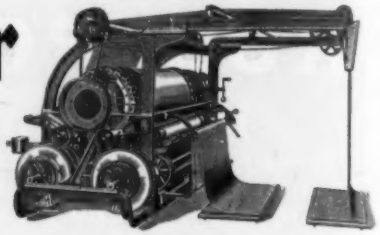

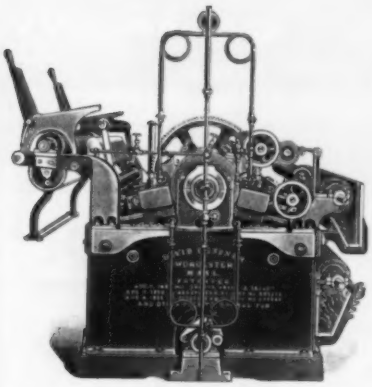

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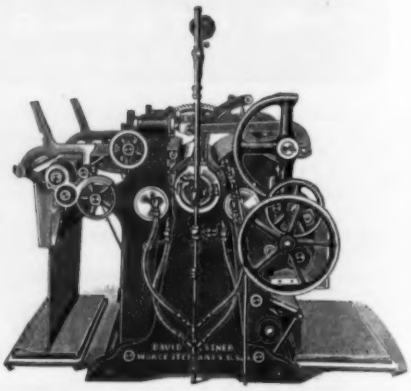

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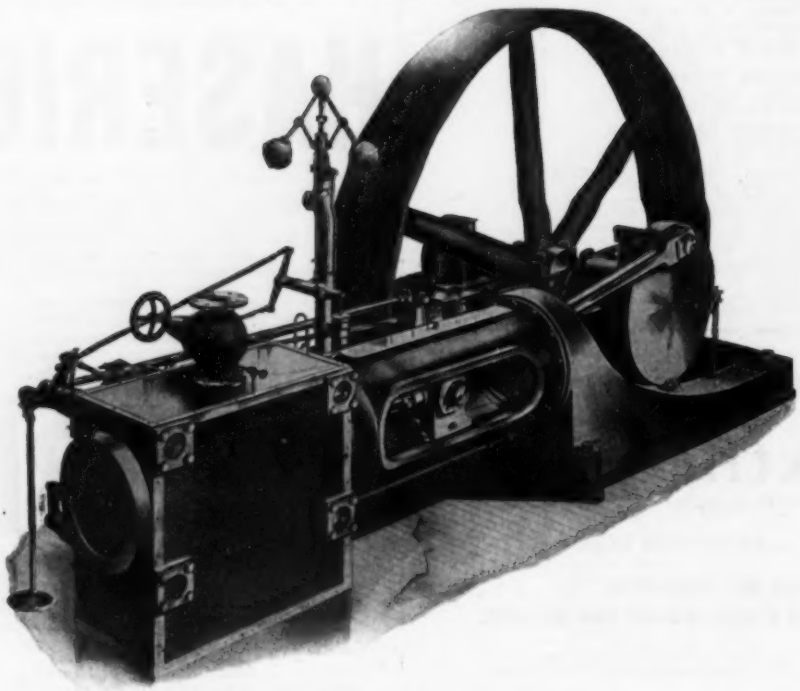

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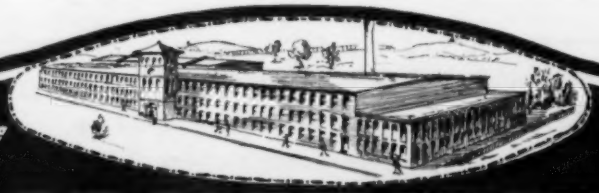

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Cotton Mill for Sale or Lease. Three thousand spindles. In centre of cotton fields in one of the best towns in Arkansas, one-half can be had for guarantee of continuous operation for 10 years by an experienced cotton mill man, other half can be bought cheap; present capital stock $30,000.00; a money maker for the right party; for further particulars address C. B. Cotton, Mgr. of Ark. Valley Cotton Oil Co., Dardanelle, Ark.

Braiding Machinery. 24 sixteen strand round braiding machines in perfect condition. Will sell complete with cans and spools for $200. Address Am. Separator Rope Co., Holmesburg, Philadelphia, Pa.

Hydro-Extractors for sale. Two of the best make hydro-extractors of standard sizes. These machines have never been run. Hydro, Textile World Record.

SMALL MILL WANTED.

A worsted yarn spinner wants a small mill with water power from 50 to 60 H. P., somewhere in New England States, near a rail road and with good he p obtainable.

Address, W. M. & A., care TEXTILE WORLD RECORD, Boston.

Water Power Factory For Sale or To Let.

20 x 70. 2 Stories. Shafting. 50-light Dynamo.
Larger plant if wanted. Address
GEO. C. McKENZIE, . . Yalesville, Conn.

... FOR SALE ...

TWO JONES BRUSHERS,

run six months, in good condition, cheap. Also **Second-hand Crawford Mangle.** THE PIONEER KNITTING MILLS CO., HAMILTON, OHIO.

FOR SALE.

Three Jones Brushers, 24 in. Rolls,

IRON FRAMES.

All complete and in good condition except Clothing which needs renewing. Having installed new and more powerful Napping Machines we have no use for these and will sell cheap. Address
ROME TEXTILE CO. Rome, N. Y.

Factory For Sale

Near Philadelphia, with or without machinery and goodwill, or owner would leave part interest as stock with good concern, At present engaged in knitting, but has ample space and power for heavier work. Lot, 300 x 160 feet. Main buildings stone and brick. Boilers, 160 H. P.; engine, 65. For particulars, address
"B," care The Textile World-Record, Boston, Mass.

Knitting Mill For Sale.

Entire plant consisting of 88 Lamb Knitting Machines, long and short carriage, gauge 7-8-9 and 10 needles to inch, with tables. Equipped with motors for power. Also three overstitch seaming machines and all necessary adjuncts to plant. Address,
AMSTERDAM SILK MILLS, 114 Fifth Ave., New York.

CHEMIST AND COLORIST

Now in First-Class English Works desires similar position in this country. Well versed in latest styles and can introduce specialties.

Address "COMPETENT," care TEXTILE WORLD RECORD, Boston.

BLEACHER AND DYER.

Situation wanted by an experienced bleacher and dyer on cotton, wool and mixed fabrics, in skein, piece or knit goods; peroxide of sodium bleach a specialty. Married.

Address Peroxide, care THE TEXTILE WORLD RECORD, Boston.

Knitting Machinery For Sale.

One (1) 24-Spindle Payne Winder, latest pattern, one hundred and eighty winder bobbins (180 .
Four (4) Excelsior Automatic Knitting Machines, 3½-in. diameter, 160 needles, 42 gauge.
Four (4) Extra Cylinders, 160 needles, 42 gauge.
Four (4) Extra Cylinders, 128 needles, 30 gauge.
One (1) Extra Cylinder, 84 needles, 12 gauge.
One (1) 16-inch Looper, 9 points to inch.
One (1) 24-in. Looper, 14 points to inch.
One (1) Abel Footer, 9 needles to inch, 12 gauge.
One (1) Cyclone Stocking Dryer.
Four (4) Huse Single Feed Rib Machines, 4½-in. diameter, with welt and slack course.
Six (6) Extra Cylinders for same.

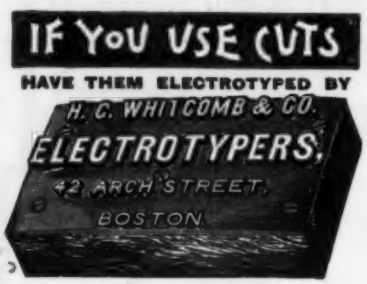
Shafting, pulleys, tables, etc., all in first-class condition, nearly new. Will be sold as a whole or separate. Cheap for cash or on time. Apply to

W. H. MURPHY, 26 Chauncey St., Boston, Mass.

FOR SALE or FOR RENT.

A 3-story building suitable for Knitting or other manufacturing, located **in the center of the knitting industry, Germantown, Philadelphia.** In addition to this building, on the same tract, there are four dwelling houses. This property can be bought or rented as whole or part. There are 15000 sq. ft. of floor space and the building is 50 ft. x 105 ft. For particulars address, **B. B. LISTER, Association Hall, Germantown, Philadelphia, Penn.**

SHEARS for finishing Cotton, Wool or Worsted Fabrics made in single sets or in several sets to finish face and back at one feed, saving space, time, cost. The Combined Shear and Roller for Carpets is an example. Baling and Finishing Presses for Straw, Felt and Buckram Hats. Shafting, Gearing. We grind or repair all makes of Shears. HOWARD FOUNDRY & MACH W'K S, Landsdowne, Delaware Co., Pa.



$10,000 to $100,000

We will furnish various amounts and other inducements to increase working capital of any good manufacturing company willing to relocate.

Several sites especially adapted for textile mills, with or without buildings now available.

FUNK, LAWRENCE & CO., Security Bldg., Chicago.

EDWARD JEFFERSON & BRO.,

Worsted Machinery

127 South 2d St., PHILADELPHIA, PA.

SOLE AGENTS FOR

J. B. FARRAR & SONS, Halifax, England.

Briggella Cork Rollers for Spinning and Drawing.

New and Second-Hand

COTTON OR WOOLEN

MACHINERY

of Every Description may be had at Low Prices from

GEO. L. SCHOFIELD, 123 No. Front Street,

PHILADELPHIA, Pa.

Send for List and state what you want.

AGENT FOR THE WESTON HYDRO EXTRACTOR.

TEXTILE MACHINERY

Large lot of Cotton, Woolen and Worsted Machinery of all kinds for sale. Best Prices paid for first-class second-hand machinery.

J. K. Lamb Textile Mach. Co.

246 Chestnut St.,

Long Distance Telephone. PHILADELPHIA, PA.

$250,000

PRIVATE CAPITAL TO INVEST

A private capitalist (young man) of standing, controlling above amount or more cash capital desires investment. Would entertain proposition of investing in the Textile manufacturing, or some high class lucrative business on that order. Party investing would expect to become official of company or would purchase entire business if not too large. Business must be on sound foundation, and not outside of Eastern or Middle States. Principals only answer, giving some particulars so as to insure attention. I am not a financial broker. This is strictly a private matter coming direct from the principal and all the correspondence treated in utmost confidence. Address "PRIVATE CAPITALIST," P. O. Box 672, New York City.

FOR SALE.

Complete Equipment for the Manufacture of Silk Mohair and Worsted Braids.

In good condition. Centrally located in Springfield. Rent of building and power if desired can be secured on reasonable terms. For information address

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WANTED.

Control of Southern cotton mill. Reply, stating location, buildings, complete machinery inventory, when constructed, name of designer, etc.

WILLIS, HOMER, FRANCE & SMITH,

Post Office Box 10, Baltimore, Md.

LAND FOR SALE

On which to Build
FACTORIES
MACHINE SHOPS
FOUNDRIES

ARE YOU INTERESTED?

We have it in city or country, near Philadelphia, with or without railroad facilities. Either by foot or acre frontage. Can give you unequaled inducements in every way. We would be pleased to open a correspondence with you; have you call on us or send our representative to you.

WM. T. B. ROBERTS & SON

419 Land Title Bldg., Philadelphia, Pa.

Harrisburg, Pa.
An Ideal Shipping Point

Have you ever experienced the need of a central distributing point for the eastern field? Many mannfacturers now carry stocks of goods here. The best located man often gets the trade. You can RENT Large, Centrally Located Warehouses with attendants, of us, or you can BUY our former plant (we now occupy our new factory), well located for manufacturing or warehouse purposes.

Harrisburg Foundry and Machine Works

COTTON GOODS.

New York selling agents doing large business in foreign mercerized cotton goods, desire to represent domestic mill, which can imitate foreign mercerized Jacquard styles. Also plain lawns required. Big business guaranteed.

Address

COTTON GOODS,
Care Textile World-Record.

Dress Goods Account.

New York selling agent doing extensive business in foreign goods, with jobbing and cloak and suit manufacturers, wants to connect with domestic mill. Good, live business guaranteed if goods are made right. Address

DRESS GOODS, Textile World-Record.

Sewing Machines FOR SALE.

Union Special make. 8 seamers or Dewee's trimmers, $85 each. 8 overseaming machines, side wheel, long arm, $135 each. All in perfect order. Terms are net cash. Will be sent to any responsible party on approval.

CHAS. W. BECKER, Agt,,
Amsterdam, N. Y.

Address Dept. 7.

FOR SALE.

Round Frames.

Eight round frame heads 30 in. diameter; 32 gauge; 16 needles to the inch; 5 feeds fully equipped to make Eiderdown or Stockinet, in excellent condition.

THE LEICESTER & CONTINENTAL MILLS CO.,
GERMANTOWN, PHILADELPHIA.

MEN WANTED.

Same rates as Wants, For Sale, etc. Manufacturers will be furnished, without charge, with the names of suitable who are entered on our list, and can usually supply their wants in this way.

A First-class Man Wanted; to take charge of finishing room in large knitting mill making fine balbriggans and men's rib goods. Must be thorough, capable, strictly temperate and married. Balbriggan, Textile World Record.

Salesman Wanted. One familiar with the mills, to handle a line of special mill supplies for which there is a good demand. Steel, Textile World Record.

Shuttle Maker Wanted. A first-class shuttle maker. No one that does not thoroughly understand the business need apply. Whip, Textile World Record.

Bobbin Maker Wanted. A man who thoroughly understands the manufacture of bobbins. Whip, Textile World Record.

HOSIERY FINISHER.

Wanted immediately by a large Western hosiery mill, a first-class boss finisher, capable of overseeing the finishing of cotton and woolen hosiery, also to have general charge or packing and shiping same.
Address, "PACKING" care TEXTILE WORLD RECORD, Boston.

WANTED.

An Experienced Lamb Machinist,

thoroughly conversant with the Lamb machine; one who has had considerable experience and can furnish first-class references. For such we have a permanent position. Give details of experience, references, and wages required.
Address **CENTRAL KNITTING CO.,**
231 St. Clair St., Cleveland, O.

SUPERINTENDENT WANTED.

A thoroughly experienced flat wool underwear Superintendent who can come at once, can secure a good paying situation. References and particulars required. Address **KNIT GOODS, Care Textile World-Record.**

DYER WANTED.

Competent dyer wanted to take charge of the Dyeing Department in Textile School. Must be well up on skein and chain dyeing, also on the chemistry of dyeing.

Address, J. W. BAILEY, Director Textile Dept,
GEORGIA SCHOOL OF TECHNOLOGY, Atlanta, Ga.

TINSMITH WANTED.

One who is thoroughly familiar with mill work, especially the making of cylinders. Steady work to sober, competent man. State wages wanted and experience. Address, SHEET METAL,
Care TEXTILE WORLD RECORD, Boston.

SITUATIONS WANTED.

COTTON SUPERINTENDENTS.

Superintendent of cotton mill, a thoroughly capable man, is open to a position. Well up on English and American makes of machinery. Has manufactured yarns both in American and Egyptian cottons, from 17's to 70's. About 40 years of age; Scotch. Has held a responsible position in a New England company for the past 10 years. 1532, Textile World Record.

Superintendent Cotton Mill open to a position. Age 33; American; married. Good experience as overseer of carding in large mills. Combed and carded hosiery yarns, shirtings, sheetings, cheviots, madras. First-class references. 2096, Textile World Record.

Superintendent. Worked on ginghams and cotton warps of all kinds. Lowell, Whitin and Draper machinery. Age 41; American. Good experience. 2095, Textile World Record.

Superintendent and Designer. Has had 18 years' experience in weaving room, 12 years being in charge of rooms in some of the best mills in New England on fine yarns and fancies and designing. Qualified for superintendent's place. 2098, Textile World Record.

Cotton Mill Superintendent, or assistant. Age 34; married. Worked on cotton machinery on coarse and medium numbers. Textile school education in designing, carding and spinning. 2003, Textile World Record.

Superintendent Cotton Mill, or would take an overseer's position in large mill North for the present. Has been assistant superintendent for past year, previous to which he was overseer of carding for nine years, and before that was overseer of carding and spinning in the South. First-class references. Can take position at once. Colored and white goods. English and American machinery. 1853, Textile World Record.

Wanted, a position as assistant superintendent of a fancy weaving mill, by a man having a thorough practical knowledge of weaving and designing. Age 32; married. 2011, Textile World Record.

Superintendent. Aged 42, married, desires position. Has worked on all classes of jacquard work, linen, damask, Marseilles and crochet quilts. Been a manufacturer in Europe; also had experience in this country. 2077, Textile World Record.

Superintendent and Carder of Cotton. Has handled all classes of goods 35 years; American, married. Best of references. 1872, Textile World Record.

General Manager and Superintendent of cotton mill desires position; 37 years old; single; English. 18 years' experience on yarns, flannelettes, denims, grays, and shirtings. Good references. 1896, Textile World Record.

Superintendent cotton spinning mill is open to position. Age 32; German; married. Is familiar with all kinds of cotton goods. Excellent references. 2074, Textile World Record.

Supt. of Cotton Mill, or overseer of mule or ring spinning is open to a position; 16 years' experience in Northern mills, on yarns, denims, awnings, apron checks, bicycle suitings, shirtings, etc., etc. Familiar with all well-known makes of cotton machinery; 29 years old; American; married. Can give references from large Massachusetts mills. 1527, Textile World Record.

Cotton Supt., 33 years old, married, and an American, experienced on coarse and fine yarns and white goods, is open to a position. Conversant with all standard makes of cotton machinery. Can refer to prominent Mass. men in the cotton trade. 1898, Textile World Record.

WOOLEN SUPERINTENDENTS.

Superintendent of large experience in the manufacture of woolen and worsted fancies and suitings, is open to an engagement as superintendent or designer. Age 45; American; married. Good references. 1982, Textile World Record.

Superintendent woolen mill. Age 47; English; married. Wants New England or Middle States. 10 years' experience in first-class N. E. mills. 2028, Textile World Record.

Woolen Superintendent, Designer or Weaver. Has worked on all classes of woolens, worsteds, cotton worsteds, fancy cassimeres, etc., and is acquainted with all Eastern makes of machinery. American; age 34; married. 1537, Textile World Record.

Agent, or superintendent, or superintendent and designer. Good manager of help and a hustler. Thoroughly understands manufacture of shoddy in all its branches, including carbonizing and extracting. Familiar with all manipulations of wool, shoddy and cotton. Fully competent to take agent's position, as is a good wool buyer, and can figure all prices on goods and percentages, etc. 2053, Textile World Record.

Manager or Superintendent of a woolen mill, who understands designing, is open to an engagement. 34 years old; Scotch, and single. Large experience in Scotch and Canadian mills on tweeds, worsteds, overcoatings, etc. Good references. 1890, Textile World Record.

Assistant Superintendent or Designer, woolen or worsted, who understands designing and also the work of every department. Has worked on fine worsteds, coverts, cheviots, kerseys, meltons and fancy cassimeres. Technical education acquired at Philadelphia Textile School. Six years' practical experience, three as designer. Age 24; American; good references. Will go anywhere. 1974, Textile World Record.

Superintendent or Designer, an American, married. 38 years of age, is desirous of obtaining a position. Understands the manufacture of worsteds, cotton worsteds, cassimeres, meltons—steam face, flannels, and horse and bed blankets. Long experience and up-to-date in methods. Moderate wage. 1936, Textile World Record.

Manager and Buyer. Blankets, yarns, rugs and government cloths. Young Englishman, 30, managing a plant of 19 sets cards and 200 looms in England, desires similar position in Canada or the States. Thoroughly practical in every department. Can invest up to $1,500 into a small business of this kind. 1976, Textile World Record.

Superintendent and Designer, English, 32 years old, married, is open to the above position in a woolen mill. 17 years' experience in England and this country on cassimeres, overcoatings, woolen dress goods, plaid backs, skirtings and cheviots. This is a good opportunity to obtain a young man of long experience. 1955, Textile World Record.

Superintendent of Woolen or Worsted Mill, who understands designing, is open to a position. 23 years of age; an American; single. Well recommended, and with good experience. 1891, Textile World Record.

Superintendent. Was eight years in every department and acted as assistant in England. Wants to get a start in this country. Would take position as assistant superintendent, designer, or assistant designer. Has had experience on high grades of plain and fancy woolens and worsteds, as well as army kerseys and cotton worsteds. 1841, Textile World Record.

WOOLEN CARDERS.

Overseer of Woolen Carding, age 32; American; married. Good experience and excellent references. Worked in kerseys, meltons, cheviots, cassimeres, coverts, dress goods, broadcloths, etc. 2060, Textile World Record.

Overseer for Washing, Carding or Combing wool for worsted wants to better himself. Speaks German, French and English. Best of references. 2083, Textile World Record.

Carder, or carder and spinner. Age 49; American. Has worked on all kinds of woolens, and of late on shoddy and cotton mixes. Is familiar with Davis & Furber machines. Excellent reference from past employer. 1944, Textile World Record.

Overseer of Carding and Spinning. Middle aged; English; married. Dress goods, flannels, blankets, overcoatings and plush goods. English and American makes of machinery, also an expert on the Bollette condenser. 2079, Textile World Record.

Boss Carder. Cotton, woolen, worsted and silk mixes of all kinds. Can take place at once, and wants not less than $3 per day. Age 48; American; married. Excellent references and experience. 2055, Textile World Record.

Overseer of Woolen Carding. Age 26; American. Familiar with all American cards. Worked on cotton, wool, shoddy, noils and mixes. Strictly temperate. Will not go West or South. Refers to past employers. 3023, Textile World Record.

Secondhand Carder familiar with all wool, wool and cotton and shoddy mixes on Davis & Furber and Furbush cards would like to obtain a position. 21 years old. American. Good references. 2000, Textile World Record.

COTTON CARDERS.

Overseer Cotton Carding. Age 35; married; 12 years' experience as overseer. Worked on all kinds of yarns from 10's to 150's, combed and carded, and is familiar with all makes of English and American machinery. 2075, Textile World Record.

Overseer of Carding. Large experience on all kinds of work and both English and American systems. Can furnish first-class references. Had charge of carding in some of the best New England mills. 3009, Textile World Record.

Overseer of Carding. Age 39; married. Worked on coarse and fine numbers and combers. American and English machinery. 3012, Textile World Record.

Overseer of Carding or cotton ring spinning. Worked on carded and combed Peelers, Egyptian, and Sea Island cottons, making yarns from 8 to 80. 3015, Textile World Record.

Overseer Cotton Carding or Spinning desires position. Age 47; American; married. Is familiar with all the modern makes of English and American machinery, revolving top flat cards, single and double carding. 2073, Textile World Record.

Overseer of Carding or Ring Spinning. Age 35; American. Sheetings, prin ? and yarns, coarse and fine. Worked on most American machinery, but is more familiar with Lowell & Whitin. 1915, Textile World Record.

Carder and Spinner, also twister, spooler and winder. Will go anywhere, but prefers New York state. Age 30; American. Shoddies and cotton mixes, camel hair, noils from 1 to 7 run for weaving or knitting. 2082, Textile World Record.

COTTON WEAVERS.

Woolen Boss Weaver. Steady, reliable and an excellent man in a weave room. Has worked on almost all kinds of woolen goods, and is familiar with Crompton & Knowles looms. Will accept position for not less than $2.50 per day. 2088, Textile World Record.

Boss Weaver or Designer, or could fill a position as all around man in a small mill. Age 42; Scotch; married. Worked on fancy cashmeres, blankets, flannels, carriage robes, and other fancy goods. Is familiar with Crompton & Knowles, Davis & Furber, and other looms. Wants to go West or South. 1940, Textile World Record.

Weaving Overseer in a small mill from 3 to 8 sets. Would take a good loom fixing job, or perching. Aged 34. Fancy cassimeres and worsteds, shawls, blankets, beavers and doeskins. Crompton & Knowles looms, old and new, also with cam and roller looms. 3002, Textile World Record.

Overseer of Weaving or designer. Age 29; American; married. Thibets, meltons, kerseys, worsteds and cotton worsteds. Crompton & Knowles looms. Good experience. First class recommendation. 2051, Textile World Record.

Boss Weaver or assistant designer. Wants position with a firm who is willing to advance a man as he proves himself worthy. 28 years old; married, and a steady worker. For past six years worked in all parts of the weave room and pattern room, pattern weaving and dressing, chain building, harness raising, perching, fixing and regular weaving. Now taking course of study in woolen and worsted designing. Excellent reference. 2019, Textile World Record.

Overseer of Weaving, or would take good second hand job. Age 42; married. Worked on dress goods, suitings, plaid backs, cloakings, meltons and other classes of goods. Worked on Crompton & Knowles loom. 3016, Textile World Record.

WOOLEN WEAVERS.

Overseer of Cotton Weaving. Sheetings, sateens and all kinds of fancies from 2 to 24 harness, lenos, lappets and jacquard. Age 32; English and married. 1934, Textile World Record.

Overseer of Cotton Weaving. Age 34; American; married Fine lawns, sateens, corduroys, crochet goods and all kinds of fancies and lenos. Can take position at once. 2087, Textile World Record.

Boss Weaver, who is familiar with cotton, woolen and worsted looms and all classes of goods, is open to a position in a large mill. 46 years of age; American; married. Strictly temperate and is recommended by some very large N. E. woolen and cotton mills. 1959, Textile World Record.

Overseer of Weaving in cotton mill. Worked on lawns, dimities, sheetings, corduroys, velveteens, etc. Colvin, Mason, Whitin, Kilburn & Lincoln, Knowles and Draper looms. 3011, Textile World Record.

Practical Boss Weaver and loom fixer wants position. Good and long experience. Good record for big production; good quality and for being a good manager of help, and the getting and keeping plenty of good hands. A sober and steady man. Will go anywhere. Either cotton, woolen or jute. 1806, Textile World Record.

Overseer of Weaving. Age 35; Scotch; married. Good experience, and excellent references, Crompton, Whitin, Lowell, Colvin, Woonsocket and English looms. Sheetings, lawns, ginghams, flannels, fine worsteds, dress goods, shirtings and novelty goods. 2016, Textile World Record.

WOOLEN SPINNERS.

Overseer of woolen spinning desires to make a change. Is familiar with suiting, union, cassimere, satinet and knitting yarns and all ordinary makes of machinery. 30 years of age; American; married. Good references as to character and ability. 1987, Textile World Record.

Overseer Woolen Spinning. Is thoroughly competent to take charge of a large spinning room. 38 years old; French; married. Has spun yarns for flannels, tweeds and knit goods, also cotton and wool mixes, shoddies, ranging in all from 1/2 to 14 runs. Is familiar with Davis & Furber, Johnson & Bassett, Platt and other makes. Very satisfactory references. 1917, Textile World Record.

Worsted Spinner or Section Hand. Age 22 and unmarried. At present employed, but not satisfied with surroundings. Would accept moderate pay. 1709, Textile World Record.

Worsted Drawer and Spinner. Would take twisting. Age 28; English; single. Can furnish references as to ability and character. 1784, Textile World Record.

Overseer of Ring or Frame Spinning, or would take superintendent position. Age 41; married. 2040, Textile World Record.

Overseer of Spinning. Fancy cassimeres, ladies' dress goods, overcoatings. Worked on both cheap and fine grades of woolen yarns. Davis & Furber mules and operators. Johnson & Bassett and Bancroft. Aged 28; American; married. 2078, Textile World Record.

Overseer of woolen spinning desires to make a change. Is familiar with suiting, union, cassimere, satinet and knitting yarns and all ordinary makes of machinery. 30 years of age; American; married. Good references as to character and ability. 1987, Textile World Record.

COTTON SPINNERS.

Overseer of Mule Spinning who has had a wide experience in large New England mills on yarns ranging from 24's to 160's is open to a position. 37 years old; American. Good references. 2003, Textile World Record.

Cotton Mule Spinner. Age 42; French; married. Has worked on prints and sheetings and on yarns from 9's to 50's. First class references. Two years' experience as secondhand and five as overseer. Wants $2.50 per day to start with. 1690, Textile World Record.

Second Hand on Mules. Has had 20 years' experience on cotton mule spinning as mule fixer and second hand. Age 39, with family. Good references. 1950, Textile World Record.

Boss Ring or Mule Spinner. Age 43; English; married. Asa Lee mules, Lowell Machine Shop, Platt, Mason mules; Howard & Bullough, Lowell and Mason frames. Yarns from 5's to 90's. 3001, Textile World Record.

Overseer of Cotton Mule Spinning. Understands Mason and English makes of mules. Has worked in mule room sixteen years, five years as second hand and a year and a half as overseer. 28 years old; married; steady and temperate. Would like to get work in N. E. or New York states. Has worked on colored hosiery yarn and filling. 1822, Textile World Record.

Overseer of Ring Spinning. Aged 42; American; married. Ginghams, sheetings, awnings, denims, etc.; $3 to $4 per day. 2018, Textile World Record.

Overseer Ring Spinning, Warping and Spooling. Is experienced on white work from Nos. 4's to 30's. Is familiar with Whitin and Lowell Machine Shop spinning frames and spoolers and warpers. Wants $3 per day to start with. Age 39; American; married. 1703, Textile World Record.

DYERS.

Dyer. Second-hand in large house, or boss dyer in small reliable woolen mill. Would accept good offer as chemist to some mill. Age 25; American. Textile graduate, and has held various positions in the laboratory and with dyestuff dealers during past three years. 2097, Textile World Record.

First-Class Dyer, Bleacher and Mercerizer is open to a position. Had a lifelong experience on cotton yarns, unions, merino, hosiery, underwear, tapes and braids. Would like to get a position in a dyehouse just starting, if possible. Is competent of erecting and equipping a modern dye plant. 2065, Textile World Record.

Dyer, Scourer and Bleacher in knitting mill. Age 39; married. All grades of underwear, spring and latch needles. First-class recommendations. Will not go West or to Canada. 3004, Textile World Record.

Dyer on cotton and woolen piece goods, yarn and fast black on cotton. Age 42; married. 3021, Textile World Record.

Overseer of Dyeing and Bleaching. Age 38; Scotch, married. Denims, awnings, ticking, outing flannel and madras. First-class references. 3022, Textile World Record.

Dyer. A young man, age 22, single, American, and now employed as a second hand in a cotton mill, would take a position as dyer in a small mill or second hand in a large mill. Has had experience in the dyeing and bleaching of cotton yarn and piece goods. 1948, Textile World Record.

Boss Dyer and Bleacher. Age 34; English; married. Yarns, warps, knit goods. Can give good references. Wants $4 or more. 3020, Textile World Record.

FINISHERS.

Finisher of Cotton Goods, also worsteds, by calender, hot press and beetle, also understands frames, starching and mercerizing. Age 25; English. 3006, Textile World Record.

Finisher, both wet and dry. Age 28; English; married. Shirtings, ginghams, cotton dress goods, mercerized effects and men's cotton suitings and trouserings. Excellent references. 3007, Textile World Record.

Cotton Finisher. Age 27. Worked on prints, lawns, dimities, muslins, ducks, drills, Madras, etc. Understands folding and packing. 3005, Textile World Record.

Overseer of Finishing, worsted goods, white or fancy. A young man; married; English. Has had full charge of piece dye finishing. 3019, Textile World Record.

Overseer of Finishing. Prefers a satinet mill. Eight years' experience as overseer. Aged 47. 3017, Textile World Record.

Boss Finisher in knitting mill, or would take charge of large room repairing sewing machines. Is anxious to secure a permanent position. Wants $3.50 per day and no lost time. Can take place at once. 2089, Textile World Record.

Boss Finisher. Would take good secondhand or wet finishing job. Age 41; English. All kinds of woolen and worsted goods, both steam and dry finish. Willing to go anywhere. Both English and American makes of machinery. Excellent references. 2061, Textile World Record.

Overseer of Finishing. Age 32; American. Woolen and worsteds, suitings, coatings, cloakings, cassimeres, cheviots, meltons, frieze, etc. 2070, Textile World Record.

DESIGNERS.

Designer in small mill or assistant in large mill. Age 22; Scotch; single. Has worked on fancy cassimeres, plaid backs, coverts, unions, worsted trouserings and shirtings. Fair knowledge of Jacquard designing. Johnson & Bassett mules, Davis & Furber dresser, and Knowles looms. Is willing to work for moderate salary, with chance of promotion. 1837, Textile World Record.

Smart Designer, high class worsteds and coatings and trouserings. Thorough experience leading factory. Now abroad; anxious to find employment in this country. Moderate start. 1816, Textile World Record.

Assistant Designer on woolen or worsted dress goods and suitings is open to a position. Age 21; American; single. A graduate of one of the largest textile schools in the country, and has had experience in a good New England mill. Also understands flannels and satinets. Good references. 1923, Textile World Record.

Designer or Assistant Superintendent desires a position. 27 years old; Scotch; married. Familiar with all well known makes of machinery and with woolen, worsted and cotton goods. Good references. Will go to any part of the United States. Terms reasonable. 1996, Textile World Record.

A Young Man, 23 years of age, English, would like a position as assistant designer or boss weaver. Has worked on woolen dress goods, cloakings, suitings and worsted suitings. Good references. Moderate wages. Three weavers in family. 1997, Textile World Record.

Designer, or assistant superintendent and designer. An A1 color designer. Can get up good line of fancy woolen and worsted goods which will be good sellers and profitable to the manufacturer. Graduate of a prominent designing and textile school in Germany. Is well posted on all kinds of stock, cotton and shoddy, and with the general work of a woolen mill. 1789, Textile World Record.

MISCELLANEOUS.

Loom Fixer. Age 27. Knowles and Crompton looms. Wants not less than $2.25 per day. Will not go West or to Southern States. 3014, Textile World Record.

Overseer of Spooling, warping, beaming, slashing and web drawing. Age 37; married. 3010, Textile World Record.

Spare Hand Loom Fixer. Wants place where he can settle down. Is familiar with Crompton & Knowles looms. Age 40. 2091, Textile World Record.

Foreman of Repair Shop. Age 30; American; married. Several years' experience in cotton mill repair work. Is familiar with almost any kind of machinery as far as repairs go.—Lowell Machine Shop, Hetherington, Kitson, Providence, Biddeford, etc. 2023, Textile World Record.

Colorist and color mixer for all kinds of printing. Also understands plush printing and extract work. 10 years' experience. Can give references. 2045, Textile World Record.

Master Mechanic wishes position in the North. 35 years old: married. Worked 15 years on repairs. Wants $3.50 per day. Has license for running engines and boilers Understands all kinds of water wheels and care of same, dynamos and electric lights and also gas houses, and a good knowledge of building, all kinds of wood work and piping and blacksmithing. Understands cotton mill repairs as good as the best man at such work. 2025, Textile World Record.

A Thoroughly Experienced Superintendent of a Broad Silk Mill, fully conversant with all details of the business, would like to connect with Southern capitalists to start the manufacture of broad silks in the South. References as to character and ability guaranteed. Silk, Textile World Record.

KNITTERS.

Foreman Latch Needle knitter, or fixer with good chance of promotion. Men's and women's underwear, cotton, worsted and silk. Worked on Scott & Williams, McMichael & Wildman, Stafford & Holt, Snyder & Fisher and the Fisher fleece machines. Recommendations. 3000, Textile World Record.

Knitter, Overseer or second-hand of knitting. Would accept good position as fixer. A young man, American; unmarried. All kinds of seamless knit goods, and all the leading makes of hosiery machinery. 2099, Textile World Record.

Superintendent or Manager of hosiery mill. American. Has had 30 years' experience. Can give best of references for character and ability. Present employers retiring from business. Salary moderate, with prospect of advance. 2047, Textile World Record.

Machine Fixer or Foreman. Age 25; German; unmarried. Is familiar with Boss, Standard, Invincible, new Victor, Excelsior, Brinton, Branson, Scott & Williams, Paxton & O'Neill and all kinds of rib machinery. Best of references. 2056, Textile World Record.

Asst. Superintendent or Boss Knitter. Age 29, strictly temperate and held position of boss knitter for past four years running. Fleeces, balbriggan and flat work on spring needles, and plaited, straight and shaped work on several makes of latch needles. Can give best of references. 1492, Textile World Record

Overseer on Spring Needle circular knitting machines wants position. An ingenious, energetic and progressive man, who has spent his life in one of the largest and best equipped knitting mills in country. Particularly good on fine jerseys, stockinets, fleeces, eiderdowns, rubber linings, dress shields, blankets, slipper cloth, etc. 2094, Textile World Record.

Foreman of Knitting Room, spring needle or flat knitting. Age 28. Fleeces of all kinds and gauges, balbriggan from 20 to 30 gauge, flat wool work all gauges. Is familiar with Tompkins Bros., Campbell & Clute and Crane machines. 2062, Textile World Record.

Cuff Knitter and Fixer. Wants a place where he will have steady work. 1951, Textile World Record.

Fixer or Foreman. 27 years old, 11 years in the manufacturing and finishing department. Familiar with Excelsior, Scott & Williams, Brinton and Branson automatic, and Scott & Williams and McMichael & Wildman ribbers and Hepworth loopers, besides having a general knowledge of other hosiery machinery. Can give best of references as to steadiness, ability, character. 3024, Textile World Record.

Superintendent. All grades and weights of hosiery and ladies' ribbed underwear. Is familiar with Standard, Boss, Nye & Tredick and Branson machines. 598, Textile World Record.

Superintendent or Foreman of seamless hosiery familiar with cotton and woolen goods on Scott & Williams, Electric, Acme, Standard and several other makes, ribbers, loopers, sewing machines, etc., is open to a position. 40 years old; American; married. Best of references. 1657, Textile World Record.

Superintendent or Manager of large hosiery yarn mill will be open to a position shortly. American; married. Has manufactured in the South hosiery yarns in natural state, mixtures, silver grays, bleached and colored. Can refer to influential men. 1961, Textile World Record.

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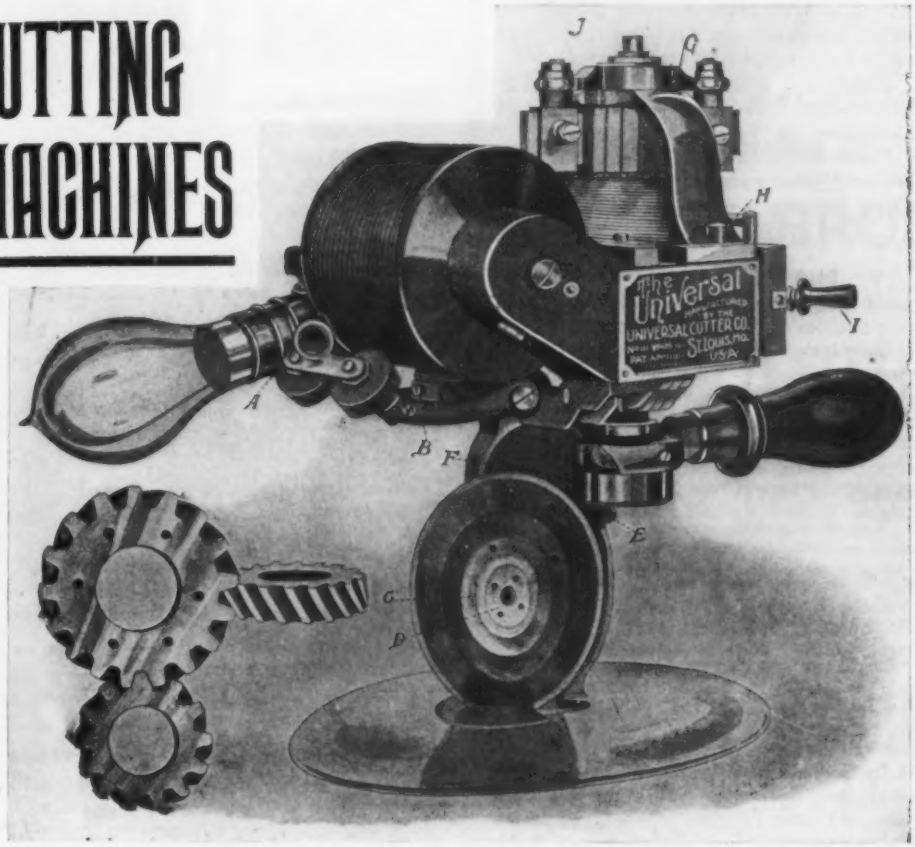

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Textile Raw Materials. *Zipser* . . 5.00
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Mechanism of Weaving. *Fox* . . . 2.50
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Textile Calculations. *E. A. Possell* . 2.00
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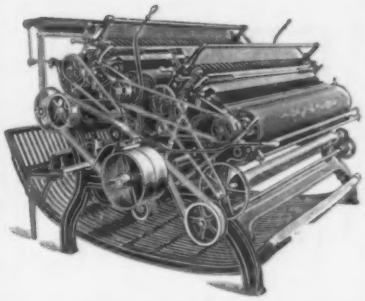

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" 2	"	2.30	"	"	"	
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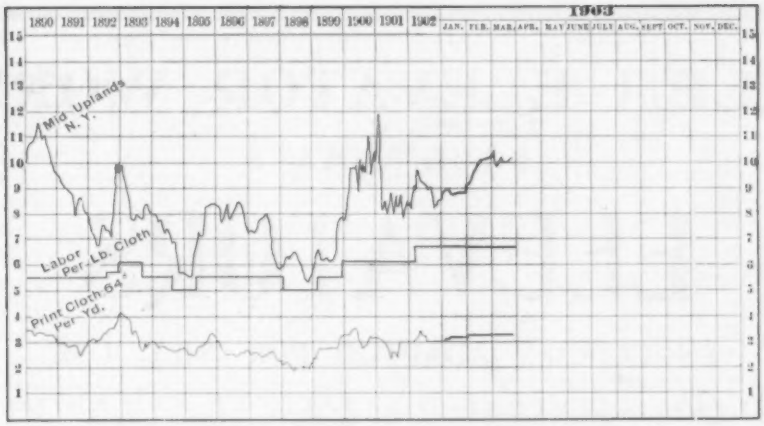
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CHART SHOWING RANGE IN THE PRICE OF COTTON TO DATE.

The Cotton Market.

The speculative cotton market has been very active during the past month, but like all other similar movements this activity has not increased the supply by a single bale. The same cannot be said of the demand. The effect, here, however, has been negative. The higher speculators forced prices, the less inclined were manufacturers to purchase supplies and the less able were consumers to purchase goods at the advance. As speculative quotations soared intrinsic values declined. There is, however, no question as to the strong position of the cotton market. Endless statistics of land areas, cotton crops, population and cotton consumption are brought forward to prove that one or two Southern states could alone produce sufficient cotton to supply the present demand, but the cold fact remains that during the past few years the demand has steadily gained on the cotton supply. The cotton supply problem cannot be solved by making calculations based on land areas and the crops of past years. It involves such factors as the labor supply which are not readily solved. Thanks to a lucky and exceptional combination of an immense area of fertile land, a uniform degree of humidity, sunshine and millions of negroes who are satisfied to pick cotton for a few months and loaf for the rest of the year, the United States has a practical monopoly of the cotton supply. For the past five years the annual product has remained practically stationary at a high mark, say 10,500,000 bales. This production has been barely sufficient to supply the demand, which has been greatly increased by the prosperity and growth of the population in the United States. The steadiness of production during the past few years cannot be counted on for the future. An examination of the annual cotton crops for the past sixty years discloses such frequent and wide fluctuations as to make the uniformity of the past five years nothing less than remarkable. We need not go back beyond 1892-3 to find a crop 25 per cent. less than that of the preceding year. Such a shrinkage in next year's production for which the planting is now going on would cause a cotton famine comparable to that during the Civil War.

Judging by the past such a condition is sure to occur sooner or later. This certainty is what causes English and Continental spinners to be as interested in the weather throughout the cotton belt as are the planters themselves. This accounts for the frantic and apparently hopeless efforts of Europe to find a supply of cotton outside of the United States.

The Chronicle estimates the world's visible supply on March 20 at 3,663,965 bales, as compared with 4,343,418 bales on same date last year; 4,075,608 bales in 1901; and 3,604,116 bales in 1900.

In the Egyptian cotton market Stoddard, Haserick, Richards & Co., under date of March 25 report as follows:

Apparently unchecked, the market has continued its upward bounds, showing an exceptional advance. ADE quality is today quoted at 18.76c., which is an advance of 6 1/2c. over August quotations. While this may be considered large, it should be borne in mind that the prices of the 1899-1900 crop, which were quoted in August, 1899, at 9.95c., were quoted in March, 1900, at 18 1/4c., this being an advance of 8 3/10c.

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Shearing Machines a Specialty.
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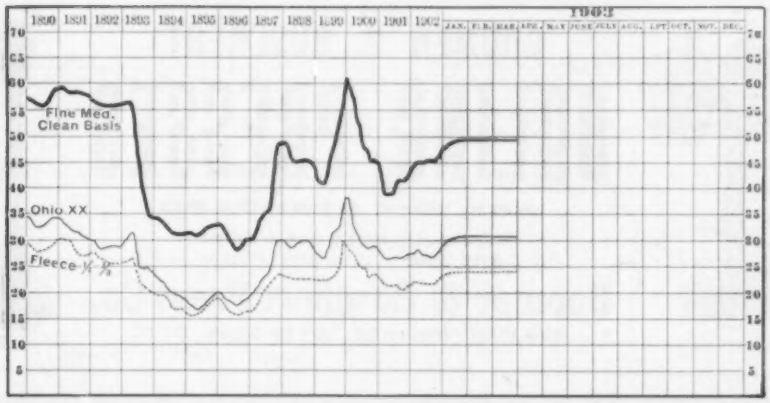

CHART SHOWING RANGES IN THE PRICE OF WOOL TO DATE.

The Wool Market.

The wool market has been decidedly quiet during the past month, due to the absence of manufacturers in want of raw material and to the willingness to see lower prices on the part of wool dealers who are under the necessity of replenishing stocks. With a new clip coming to the seaboard it is not likely that materially higher prices will be recorded until after the new supply has been purchased by the dealers who in turn are to deliver it to the manufacturer at a profit. The lower prices go before purchasing, the larger will be the profit in reselling to the mills. Wool dealers have learned during the past few years that driving the purchase price down has the same effect on their ultimate profits as pushing the selling price up, and it is for this reason that the Eastern traders are bearish now while waiting for the coming of the new clip.

The goods market is fairly satisfactory, but clothiers have been slow in purchasing, holding off to the last moment and doing all in their power to make the goods market a buyer's market. In this they have succeeded but partially, and the withdrawal of cancellations has in many cases indicated that there is no surplus of goods in existence and that the path from the mill to the consumer is a straight one.

In the West good prices are being paid for the new clip. In some cases the prices are actually higher than last year. This may serve as a hint to the manufacturer to take advantage of any bargains that he may find in the East.

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JUSTICE, BATEMAN & CO.

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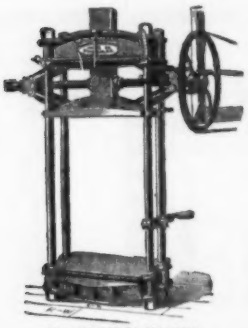

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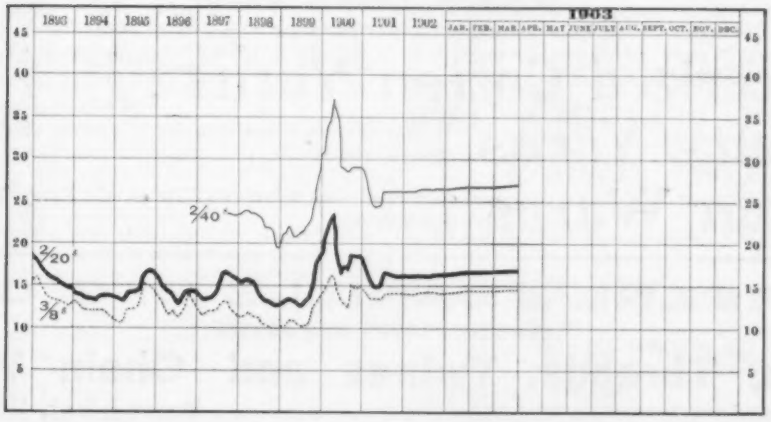
Office and Works: BOSTON, MASS.

Yarn Department.



GRAPHIC CHART SHOWING RANGE OF PRICE OF COTTON YARN TO DATE.

The Cotton Yarn Market.

Conditions in the cotton yarn market have continued satisfactory to the seller, and it is by no means improbable that the buyers themselves are gratified to see an advance from the low quotations of last year which demoralized the markets for knitted and woven fabrics as well as for yarn. The high price of cotton has been a strong card for the spinners in their dealings with buyers. Concessions on asking prices have been out of the question on nearly every grade. Possibly very coarse hosiery yarn continues to show traces of the old time weakness, but elsewhere strength is the rule. Quotations are slightly in advance of last month. Knitters are complaining on account of late deliveries and these complaints are duplicated among the jobbers and large retailers who are calling loudly for goods that were ordered early in the season. These are signs of prosperity which it is to be hoped will long be with us. We quote as follows:—

Cops.

6's	17
8's	17¼
10's	17½
14's	17¾-18½
16's	19¼
22's	20¾
24's	21¾
26's	22½
30's	24½
34's	25
36's	25½-26¾
40's	26-28¾

On cones, ¾c. more up to 14's; 1c. more from 15's to 22's; 1½c. from 23's to 35's, and 2c. above that.

Eastern Two-Ply Skeins, Carded Peeler.

12's	18½
14's	19
18's	20
20's	21-21½
22's	21½-22
26's	22-22½
28's	23-23½
30's	24-24½
36's	26-27
40's	27-28
45's	28-29
50's	32-33
55's	34-35
60's	41-42

Eastern Two-Ply Warps, Carded Peeler,

2/30's	25-25½
2/36's	27
2/40's	28-29
2/45's	29-30
2/50's	33-34
2/60's	42-43

Egyptian Weaving Yarns.

Single Skeins Combed.

30's	36-37
35's	39
40's	41
45's	43
50's	44-45
55's	49
60's	54½
70's	59-60
80's	64
90's	70

Two and Three Ply Skeins, Combed.

30's	39-40
36's	42-43
40's	44-45
45's	48-49
50's	51-52
55's	55-56
60's	58-59
70's	66

THE J. R. MONTGOMERY CO.,

Windsor Locks, Conn.

MANUFACTURERS OF

Mercerized Cotton Yarns Gives the High Silk-Like Lustre in Knit Goods and Woven Fabrics.

Novelty Yarns Boucle, Bourette and Spirals, in Cotton, Wool, Worsted, Mohair and Silk.

Cotton Warps on Beams, Jack Spools and Tubes. In Fancy, Twist, Colors and Printed.

GREENE & DANIELS MFG. CO.,

COMBED, CARDED AND GASSED

Yarns, Threads, Twines and Chain Warps,

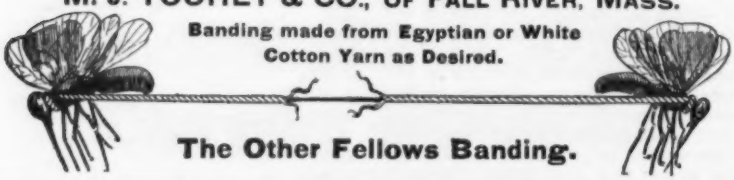
Colored and Bleached Yarns Furnished in any manner desired by the trade.

Pawtucket, R. I.

THESE MULES CANNOT BREAK THE BANDING —MADE BY—

M. J. TOOHEY & CO., OF FALL RIVER, MASS.

Banding made from Egyptian or White Cotton Yarn as Desired.



The Other Fellows Banding.

MONUMENT MILLS,

Manufacturers of

White, Colored, Fancy and Double Twist

COTTON WARPS

HOUSATONIC, MASS.

4s to 60s.

Dana Warp Mills

WESTBROOK, ... MAINE

White and Colored Warps 6s to 50s Single and Ply

Mule Cops From 30s to 50s from American & Egyptian Cotton

Philadelphia Yarn Market.

Spinners have been able to maintain the high prices on yarns. While business for future delivery has not been large, there has been sufficient transient trade to use any surplus yarn that spinners have to offer, and as long as the demand is sufficient to prevent an accumulation of stock, prices will not decline.

Fine numbers of underwear yarn have been in very good demand and have been sold as much as 5 cents per pound advance over last fall's prices. There is nothing in the outlook for cotton to encourage spinners to reduce prices.

While there has been some decline in the speculative market, buyers of spot cotton in the South, in good grades, are now paying the highest prices of the season.

Yarn prices are ruling higher than last month, and the market is in a condition to be easily influenced either way.

We quote as follows:

7's and coarser	16¼-16½
8's and 9's	16¼-16¾

Southern frame cones (good quality):—

10's	16½-17
12's	17-17½
14's	17½-18
16's	18-18½
18's	18½-19
20's	19½-20½
22's	20-21
24's	21-22
26's	22
30's	23
40's	27½-28
50's	33-34

Southern high grade mule yarn:—

Cones.

10's	17½
12's	18
14's	18½
16's	19
18's	19½
20's and 22's	20-21½
24's	22

Southern frame yarn, lower grades:—

6's and 8's	16
10's	16¼-16½

Eastern cones (high grade quality):—

10's	18-18½
12's	18½-19
14's	19-19½
16's	19¾-20
18's	20-20½
20's and 22's	21-22

Lower grades Eastern yarn:—

6's and 8's	16
10's	16½-17

Rise ¼c. per number to 16's.
Skein yarn (mostly Southern):—

BUCKINGHAM, PAULSON & CO.
Commission Merchants
COTTON YARNS of all Descriptions
83 LEONARD STREET, NEW YORK
302 Chestnut St., Phila. 210 Munroe St., Chicago, Ill.
Cash Advances, Cash Sales and Prompt Returns. Consignments and correspondence solicited.

JAMES E. MITCHELL & CO., COMMISSION MERCHANTS.
Cotton Yarns
FOR ALL PURPOSES.
122-124 Chestnut Street, PHILADELPHIA, PA.
Brown Building, 185 Summer Street, BOSTON, MASS.

CATLIN & CO.,
Yarns.
67 CHAUNCY STREET, BOSTON.
216 CHURCH STREET, NEW YORK.
206 CHESTNUT STREET. PHILADELPHIA.

Ballou Yarn Co.
PROVIDENCE, R. I.
Harness and Seine Twines and other Job Gassing, Winding, etc. All Numbers.
GASSED YARN SPECIALTIES

A. D. SALKELD & BRO.,
With FRED'K VIETOR & ACHELIS,
YARNS.
66-72 LEONARD STREET. - NEW YORK.

EICHMANN & STERNBERG,
530 Broadway, cor. Spring Street, NEW YORK.
MERCERIZED TURKEY RED GASSED } **COTTON YARNS.**
JACQUARD and HARNESS TWINES.

J. S. DODDS,
346 Broadway, N. Y. Life Bldg., New York, N. Y.
MERCERIZED YARNS
Two and Three Ply, for all purposes,
In Peeler, Egyptian and Sea Island, gassed and ungassed, natural and dyed. Fast Black for cross dyeing a specialty.

EDDY & STREET,
Cotton, Woolen,
Yarns and Braids
Worsted, Spun Silk.
PROVIDENCE, R. I.

CAPACITY, 50,000 Spindles. **ORSWELL MILLS** FITCHBURG, MASS.

COMBED **COTTON YARNS** CARDED

In Chains and Skeins, on Balls, Beams, Spools—Single or Twisted.

Oil Seeds Pressing Company,

MANUFACTURERS AND IMPORTERS OF

VEGETABLE OILS,

15 TO 25 WHITEHALL STREET, NEW YORK.

Indian Orchard Company.

Cotton Warps and Yarns. In Gray and all Colors, Single or two or more Ply, and Cable Cord.

Novelty Yarns. in Various Patterns, Colors and Twists.

Carded and Colored Cotton. For Mixing with wool. Machined or in Roving.

J. Morgan, Pres. H. K. Wright, Treas. W. C. Godfrey, Agt.

Indian Orchard, Mass.

GRANT YARN CO.,

COMBED AND CARDED COTTON.

YARNS 40's and above. AND

FITCHBURG, MASS. **WARPS**

LUZERNE COTTON YARN CO.,

MERCERIZED YARNS.

Mercerizers, Dyers, Bleachers and Coners,

WILKES-BARRE, PENNA.

American Cotton Yarn Exchange

COMBED and CARDED

COTTON YARNS

From Northern and Southern Mills.

American, Egyptian, Peruvian and Sea Islands.

ARNOLD B. SANFORD, Pres. and Gen. Mgr.

PERCY H. de MAURIAC, Vice President.

OFFICES: 67 Chauncy St., Boston.
240 Chestnut St., Philadelphia.
108 Franklin St., N. Y. with James Talcott.

THE MALCOLM MILLS CO.,

MANUFACTURERS OF

FANCY YARNS and POLISHED THREADS.

Offices: 229 Chestnut St., Philadelphia.

Mills: Frankford, Pa.

4's to 8's soft	15½-16
10's to 12's	16-16½
14's to 20's	17-18
22's	18½
14/2	16½
16/2	17
20/2	18½
30/2	22-22½
40/2	27
16/3 slack	16¾-17
12/3 slack	16¼
8/3 carpet	15
8/3 slack	15-15¼
9/4 slack	15-15¼

Warps (mostly Southern):—

14's to 16's	16½-17
20's to 22's	17½-18
26's	19½
14/2	17
16/2	17½
20/2	18½
24/2	20-20½
30/2	22-23
40/2	27

Mixed colored yarns (mock twist, half colors):—

6's to 10's	17½-18
12's to 14's	18½-19½
16's to 18's	20-21½

Silver and jaeger, 1½c. over white.
Mock Egyptian, 2c. advance over white.
Egyptian, 4c. to 5c. above best quality white.

Worsted Yarns.

Spinners are slackening down and within the next two months will find it difficult to run on full time. This state of affairs is brought about by two causes. In the first place spinners have many orders without spinning instructions, and in the second place weavers although securing orders for cloth are not buying. The spinners realize that the present is a poor time to sell yarn when weavers dare take orders for cloth without covering on yarn. This is certainly a dangerous policy which will bring trouble to the weaver as these orders sooner or later must be filled and in all probability they will all be placed at once.

Weavers hold out anticipating lower prices but may get caught later doing this business. The orders secured by weavers have been largely for piece-dyed worsteds and imitation of fancy worsteds with mercerized cotton effects. On fancy worsteds manufacturers have secured orders only to the extent on yarn purchased at old prices—further than that manufacturers are taking orders without profit in order to keep machinery running to bridge over until prices recede.

On some styles of piece dyes using 1/4 to 3/8 Blood yarn manufacturers have many orders but have not covered for yarn because they believe that the longer they can hold out the cheaper they can buy yarn. This yarn is not getting lower as rapidly as they would wish. Weavers state that some light weight orders had to be cancelled because they were unable to get the cloth out on time, and weavers state if buyers would buy evenly

RICHARD A. BLYTHE,
Commission Merchant,
COTTON YARNS OF EVERY DESCRIPTION.
114 Chestnut St., Philadelphia.

LINEN YARN IMPORTER.
HUGHES FAWCETT, 115 Franklin Street, NEW YORK.
Flax, Hemp and Jute Line and Tow Yarns, For Weaving Purposes.
Linen Jacquard Harness Twines, Fine Cotton Harness and Heddle Twines, For Cotton, Silk, Woolen and Carpet Manufacturers.
Correspondence solicited. Samples promptly furnished.

C. MOORE & CO.,
Manufacturers of
TWINES, THREADS AND YARNS,
Jacquard Harness Twines of all kind on hand and made to order.
S.W. Cor. Fifth and Market Sts., Phila.

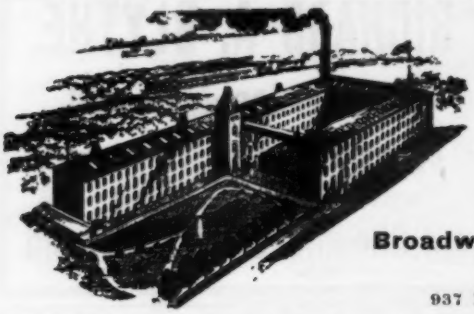
DEXTER YARN CO.
Cotton Yarns in Cops, Cones and Skeins; on Beams or Spools, Single and Twisted, Cable Cords and Twines.
PAWTUCKET, . . R. I.

Walcott & Campbell Spinning Co.
Fancy Hosiery Yarns
IN ALL COLORS
New York Mills, Oneida Co., New York

JENCKES SPINNING CO.,
Formerly E. JENCKES MFG. CO.
Carded and Combed Cotton Yarns for Weavers and Knitters.
Double and Twist Yarns for Woolen Trade.
PAWTUCKET, R. I.

WILLIAM B. CHARLES,
Cotton Yarns,
Cotton Cloth,
Silesia, Sateens,
For the Underwear Trade.
AMSTERDAM, N. Y.

HOWLAND CROFT, SONS & CO.



LINDEN WORSTED MILLS.

FINE WORSTED YARNS.

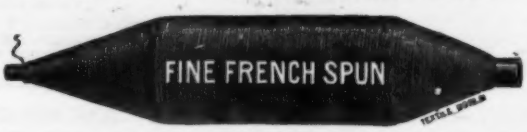
Office and Mills:

Broadway and Jefferson Ave., Camden, N. J.

Represented by FIRTH BROADHEAD.
937 Banigan Building, - - Providence, R. I.

ALLEGHENY WORSTED MILLS,

Thomas Wolstenho'me Sons & Co.,
MANFRS. OF
ALL NUMBERS
SINGLE AND TWO-PLY,
On Cop or in Skein, for Weaving and Knitting Purposes, in White, Natural and Fancy Mixes.



Worsted YARNS

Sell Direct,

Office and Mills, Frankford Ave. and Westmoreland St., Phila, Pa.

POCASSET WORSTED COMPANY,

Worsted Yarns.

OFFICES:

6th Floor, Banigan Building,

PROVIDENCE, R. I.

CRANSTON WORSTED MILLS.

Worsted and Mohair Yarns—White or colors, in skeins, on spools, cones, or shuttle bobbins.

Novelty Yarns—of Mohair and Worsted. We are the only manufacturers in the United States making these yarns from the raw material to finished product and making yarns only.

Genapped Yarns of all kinds. Doup Yarns. Harness Yarns. For Braids, etc.

DYERS OF YARN AND SLUBBING. BRISTOL, R. I.

French System. Bradford System.

B. F. BOYER & CO.,

MANUFACTURERS OF

WORSTED AND WOOLEN YARNS,

Office and Mill, Delaware and Cooper Streets. CAMDEN, N. J.

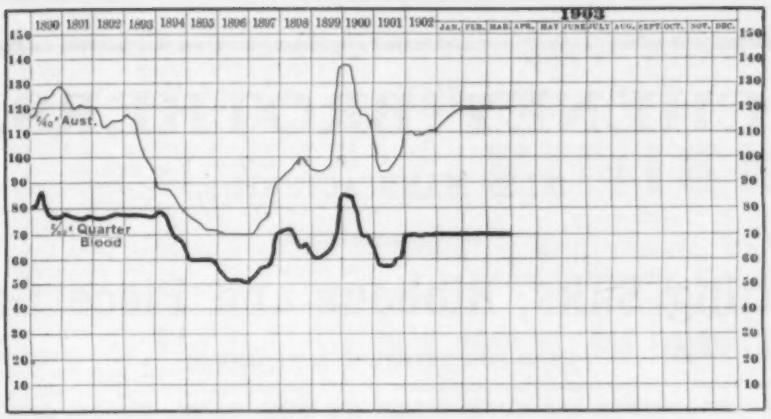


CHART SHOWING RANGES OF PRICE OF WORSTED YARNS.

throughout the year they could get cloth out on time.

Clay worsteds are selling slowly but this is caused by the endeavor of the buyers to break the market. This will not be accomplished on clay worsteds as this class of yarn and wool is well maintained.

Some weavers have stated that they put on some very cheap lines just to show that they could make cheap cloth and the cheap lines have filled the mill up with orders. Many weavers have got out new lines of goods in hopes of catching orders when the buyers start to buy cloth next month.

Some of the weavers of fine worsted are making cloth which imitates worsted cloth. They give the woolen yarn a hard twist which gives the cloth a very smooth surface and has the appearance of worsted cloth. It is always well to heed both sides of a story, and on fine worsteds it is hard to see where there can be lower prices.

The clip begins to move in April and about the 15th there will be much excitement in the West over the high prices which will prevail, and with the comparatively low stocks in Boston will show buyers the folly of expecting lower prices for cloth and yarn on medium and lower qualities.

It is believed in some quarters we may see slightly reduced prices but no slump. Buyers will get through trying to force lower prices for cloth, and will begin to purchase the better lines between April 5th and May 1st.

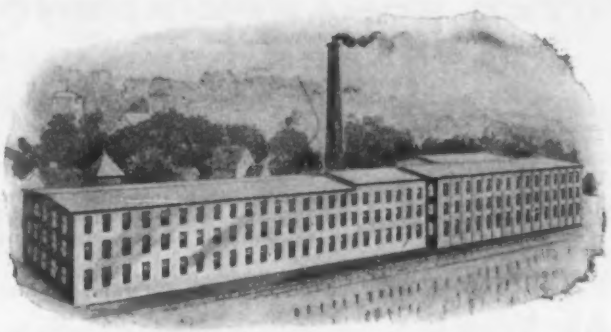
SILK NOILS AND SILK NOIL YARNS
In White and Colors.
A. T. SKERRY & CO., 47 Leonard Street, NEW YORK

MOHAIR LOOPS, KNOTS AND FANCY YARNS FOR DRESS GOODS & CLOAKINGS.

QUEENSBURY MILLS.

FLYER

MOHAIR TOPS AND YARNS FOR WEAVING.



SPUN

LUSTRE YARNS FOR SERGE LININGS.

SPINNERS OF MOHAIR YARNS FOR ZIBELINES. DRESS GOODS YARNS. ALPACA YARNS.
Yarns for Knitting. Worsted Yarns. Yarns for Mohair Serge Linings.
WORCESTER, -- -- MASS.

CHENEY BROTHERS,

SILK MANUFACTURERS,

——ALL KINDS OF——

Knitting Silks, Ribbons and Piece Goods

USED FOR TRIMMING KNIT GOODS.

TRAMS, ORGANZINES and SPUN SILKS, IN THE HANK, OR ON CONES, FOR MANUFACTURERS' USE. SILK FOR SPECIAL PURPOSES MADE TO ORDER.

Mills: SOUTH MANCHESTER and HARTFORD, CONN.

SALESROOMS:

477, 479 and 481 Broome Street, NEW YORK.
929 Chestnut Street, PHILADELPHIA.
79 Chauncy Street, BOSTON.
239 Fifth Avenue, CHICAGO.

WILLIAM RYLE & CO.,

Foreign and Domestic

Spun Silk Yarns and Noils.

Domestic Thrown Silk of every description. Fine Pure Dye Silks for the woolen trade a specialty. Importers of European and Asiatic Raw Silk.

54 Howard St., cor. Mercer St., NEW YORK.

UNITED SCHAPPE AGENCIES, INC.,

438 Broadway, NEW YORK CITY.

SCHAPPE, SPUN SILK.

Hard and Soft Waste. Cotton Yarns.

CHAS. E. LOTTE, President.
S. RHEINBURG, Sec. and Gen. Mgr.
F. E. KANE, Treasurer.

ANNEX-434 BROOME STREET.
Department Skeins, Silk Warps, etc.
S. S. KAPLAN, Manager.

TELEPHONE CONNECTION.

FIRE HOSE CORDS From long staple cotton—6s to 20s yarn in 2 to 100 ply—16 lbs. without a knot.

COTTON WARPS On beams—single or ply yarns, grey, bleached or colored.

GLAZED YARNS All plys—any color—for braiders, harness and sewing threads.

UNIVERSAL WIND For braider cops—warp yarns—grey or colored—2 inch to 12 inch traverse.

Dyeing facilities are new and best quality work guaranteed. We are prepared to dye yarns for other parties.

WHITTIER MILLS, Selling Office, SPRINGFIELD, MASS, MILL: CHATTAHOOCHEE, GA.

Dress goods and bunting manufacturers have many orders but are buying yarn in limited amounts, as they too are hoping for lower prices. One large dress goods manufacturer stated that he had orders which would last him until August. That he was selling his goods short and taking his chances on getting yarn at a price which will enable him to get a profit. At present his orders for yarn are small and spinners are declining to accept prices he is offering. Although dress goods mills have secured many orders it is doubtful if there is any profit in the business. The margin of profit, if there is any, is very small, and whatever profit is made is mostly by increased production. Bunting manufacturers are very busy, but state that any increase in price stops sales. Those weavers in Lowell welcome the strike of the Lowell cotton mills as they are thus able to start up idle looms. French spun yarn is in good demand and prices are firmly maintained, for, whatever may be the condition of medium yarn, finer grades are well maintained.

The hosiery manufacturers are busy on goods which take French spun yarn and have orders which will last them well into the summer. Top combers are busy but not rushed. There is undoubtedly a slow business caused by buyers keeping out of the market, but this is to be expected at this time as this policy of holding out of the market for three or four months and then requiring goods to be forwarded by express has been enacted for the last three years. There was not much if any clothing carried over from last year and no large stocks have accumulated so that by the middle of April a general and great revival of business is to be expected. Prices well maintained on fine yarns and slightly but not quotably lower on medium and fine medium yarn. We quote as follows:

2/40's Australian	1.25
2/40's XX Delaine	1.10
2/40's Half Blood	1.05
2/20's Half Blood	.85
2/36's ¾ Blood	.75
2/26's ¼ Blood	.68

TRY OUR
Silkine, also Lisle Silk
FINISH
—FOR—
Hosiery, Knit Goods, Yarn, Fast Black, Harsh Colors, and Fibres.
O. K. SOAP CO., 968 Franklin St., PHILA.

RICHARD CAMPION,
Selling Agent for
BRISTOL WORSTED MILLS,
HIGHLAND WORSTED MILLS.
Worsted Yarns
ALL QUALITIES AND NUMBERS.
17 Bank Street,
PHILADELPHIA, .. PA.

Speed & Sephenson,
WORSTED and WOOLEN
YARNS
A SPECIALTY.
ALSO TOPS.
170 SUMMER ST., BOSTON.
Long Distance Tel. 4168-2 Main.

SAVOGRAN
Cleans Wool, Floors, Anything.
INDIA ALKALI WORKS, Boston.

E. G. HARPER,
WORSTED and WOOLEN YARNS,
MERCERIZED COTTON,
395 BROADWAY, TEL. 1020 FRANKLIN NEW YORK.

The Cleveland Worsted Mills Company,
WORSTED YARNS
For Knitting Mills. : : : In the Grey or Colored.
CLEVELAND, OHIO.

Woolen and Merino YARNS

Eaton Rapids Woolen Mills,
GRAND RAPIDS, MICH.

JOSEPH M. ADAMS CO.
WOOLEN YARNS,
Carpet Backing and Rug Yarns a Specialty.
ARCOLA MILLS,
Main St., foot of Centre St., Manayunk, Phila.

KEYSTONE SPINNING MILLS CO.,
Manufacturers of
Woolen Carpet and Rug Yarns,
Wool Scouring, Carbonizing, Garnetting,
1631 No. Second St. PHILADELPHIA, PA.

Woolen and Merino Yarns,
1 to 10 Runs, at reasonable prices.
All Wool, Mohair and Wool Spun or Mixed Cotton and Shoddy Yarns, in white, gray, and colors.
Dress Goods Yarns a Specialty.
E. M. ROCKWELL, - - LEOMINSTER, MASS.

YARNS Solis, Boston.
179
DEVONSHIRE STREET.
ANDREW J. SOLIS, Jr. & CO.

Knitting and Weaving YARNS.

Cones, Cops, Warps, Skeins,
Single, Double, Three-Ply, etc.
Peeler, Egyptian, Mixed Colors.
Large Assortment.

EDWARD S. HYDE,
223 and 225 Chestnut Street,
PHILADELPHIA, PA.

Woolen Yarn.

Spinners continue very busy and have work which will last them until September. More machinery could be employed were it possible to secure it. The machinery now in use is largely employed by cloth manufacturers of all kinds. The knitters and hosiery manufacturers have been holding out of the market hoping for lower prices, but instead of securing lower prices when they are forced to buy, they will find it impossible to make a contract for yarn as the spinning machinery has all been contracted for.

Many of the weaving mills making heretofore a fine worsted fabric out of worsted yarn are now making an imitation out of a hard twisted wool spun yarn made from fine wool and tops to give the hard worsted effect. Many yards of this class of cloth are being sold and is largely cutting down the production of worsted yarn. Buyers of cloth are keeping out of the market in hopes of breaking prices, but the position of wool is so strong that concessions cannot be made by manufacturers and as buyers are getting nearer the time when orders must be placed, they are paying prices and are enabling the mills to be started.

We hear of one case where an agent had stated his prices, etc., to a buyer. The buyer insisted that he would not pay the price and walked to the door and then returned and stated to the agent that he must have the goods even at the agent's price and a deal was consummated and the mill secured rush orders for deliveries. Many of the buyers are in this same position and by April 15th to May 1st many orders will be placed. The buyer will certainly get the worst of it this time. The demand for cloth will be good while on the other hand the supply is liable to be curtailed. The demand for dress goods out of woolen yarn has been good but the profit is small and the only way manufacturers get a new dollar for an old one is by increased production.

The knitters in New York state have been busy on a medium class of underwear. The finer grades of underwear are made the last of April and May. What these manufacturers propose to make these fine garments out of is the unknown quantity today. Buyers insist that they will pay no more for goods. Australian lamb's wool is selling for 72 to 75 cents per pound, against 62 to 65 cents one year ago. The only way out of this trouble is by using Australian thread waste, which can be bought around 60 cents per pound. This thread waste garnetted and mixed with fine domestic wool makes a very sightly garment. The market on fine thread waste holds firm with stocks much reduced. The market on fine merino wools closed one to two cents advance. Australian lamb's wool very scarce. Medium wools and coarse wool lower.

M. B. SCHWAB, Pres. H. RAWITSER, Treas.
ED. GLUECK, Sec. and Gen. Mgr.
RIVERDALE WOOLEN CO., MANUFACTURERS OF
.. Shoddies ..
Of every description. Capacity 7,000,000 pounds per annum.
Custom Carbonizing and Garnetting a Speciality.
New York Office.
140 DUANE STREET. RIVERDALE, NORTHBRIDGE, MASS.

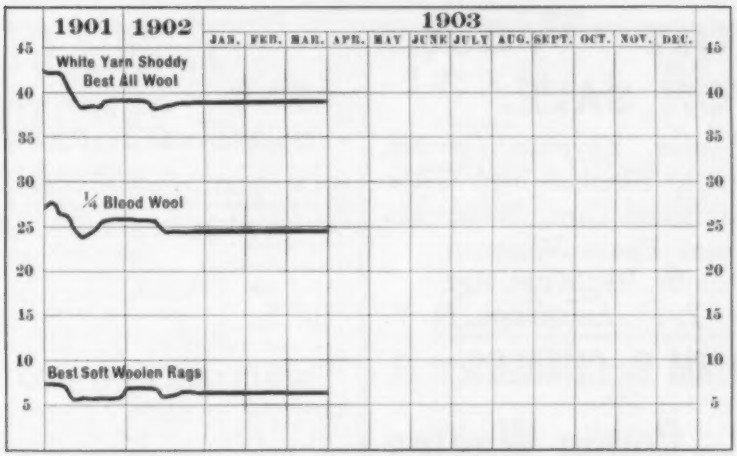


CHART SHOWING RANGE OF PRICES OF SHODDY, RAGS AND NOIL.

Rag and Shoddy Market.

A fair business has been done in this market during the past month. The dullness in the goods market has had its effect in restricting purchasers for manufacturers and prevented any increase in the volume of business and also any advance in price. There is one factor, however, that has tended to improve the position of rags and shoddy and that is the preference given to carded woolen goods as distinguished from worsted effects. This has been particularly noticeable in the coarser grades of stock which for a long time have been the dullest feature of the market. This class of material is in rather liberal supply at the present time so that dealers find themselves in good position to respond to any increase in the demand. The weakness in wool, although slight, has had its effect on the trade in wool substitutes. This has been due more to the imagination than anything else, as wool quotations still remain at a high level and the decline that has taken place has not been sufficient to induce manufacturers to use wool more freely in place of wool substitutes.

The heavy weight season has advanced so far as to create doubts in the minds of dealers as to the season's business showing any increase over last year. The initial orders were less than expected and duplicates have not been sufficient to supply the loss recorded. Prices of both rags and shoddy have remained stationary and in spite of the slightly increased demands for some grades of coarse stock, the quotations on these lines have shown signs of softening.

Shoddy manufacturers have been able to keep their machines in operation, but orders have come in slowly and but few of them can count very far into the future with certainty. Their customers have shown no disposition to carry large stocks of shoddy to supply an imaginary demand in the future and in turn the shoddy manufacturers have adopted a similar policy in regard to rags, buying sparingly and only to supply needed requirements.

We quote as follows:—

SHODDIES AND EXTRACTS.

White yarn, best all wool	38-40
White knit, all wool, best, fine	28-32
White knit, No. 2	23-25
Light yarn, extra fine	25-28
New pure indigo blue	23-25
Fine worsted, new black	26
New blue ciip, best, fine	20-22
Dark mixed yarn, extra fine	22-24
All wool yarn, medium and coarse grades	15-20

Merino.

Fine light, all wool, No. 1	24-25
Medium light, all wool, No. 1	16½-17½
Medium light, all wool, No. 2	14-16
Fine black, all wool	20-22
Fine dark, all wool, best grade	20-21
Medium dark, all wool, No. 1	13-15
Medium dark, all wool, No. 2	12-13
Red knit stock, strictly all wool	19-20
Red flannel, all wool	19-20
Dark blue for hosiery, strictly all wool, No. 1	17-20
Dark blue for hosiery, not all wool, No. 2	12-14

DELAINE EXTRACTS.

Light	19-22
Medium light	15-17
Regular gray	12-13
Black	14-15
Fancy colors	16-20

WOOLEN RAGS.

Fine merchant tailors, all colors	10½-12
Choice light colors	13-15
Browns	12-13
Blacks	9½-10½
Fine blues, plain	11-12
Fine dark	10-11
Medium dark	7-8

Worsteds.

Blue	16-18
Black	21-23

Serges.

New black	15-16
New blue	16-17

Flannels.

New scarlet	18½-22
New blue	17-18
Cloakings	3-4

SOFTS AND KNIT STOCK.

Soft woolens, best	7-7½
Old white flannels	14-16

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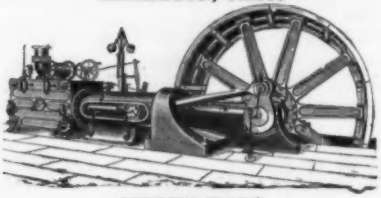

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White flannels, No. 2	11-12
Old red flannels	9½-10
Light blue flannels	7½-9
Old blue flannels	6-7
Old plaids	5-7
White stockings	17-18
White hood stock	20-21
Clear hoods	9-10
Red Stockings	9-10
Blue stockings	8-9
Fancy stockings, No. 1	7-9
Gray stockings	9-10
Black stockings	9-10
Knit stock comforters	6-7½
Red knit	9-10
Light gray knit	9-10
New light fancies	16-18
New fancies	12-14
Merinos.	
Light, fine	15½-16
Light, coarse	8-8½
Fine, dark	11-12½
Dark, No. 2	5-6½
Coarse dark	4-4½
Blue	10½-11½
Blue—seamed	14-15
Black—unseamed	11-12
New Black	18-20
Small	3¼-4
Bunting	6-8
FLOCKS.	
Shear, fine white, all wool	9-11
Fine indigo blue, all wool	9-9½
Fine black, and blue, all wool	7-8
Fine dark, all wool	5-6
Gig, fine, all wool	3-4
No. 1, black, all wool cut	6-7
All wool, fancy, shear and gig	2½-3½
COTTON WASTE.	
No. 1 Spinners	7¾
No. 1 Machine	5-5½
No. 2 Machine	4½-5
Machine Cop	5½-6
No. 1 Cop	6½-7
No. 1 Card	7-7¼
No. 2 Card	4½-5
No. 1, Oily Card	3¾-4¼
No. 2 Oily Card	3-3½
Egyptian Card	8½-8¾
Peeler Combing	9-¼
Egyptian Combing	9¼
No. 1 Linters	3½-4½
No. 2 Linters	3-3½
White Clips	5½-6
Colored Clips	2½-4½
No. 1 Picker	1¾-2½
NOILS.	
Australian	48-50
Fine domestic	38-40
½ Blood	24-28
⅜ Blood	22-23
¼ Blood	17-19
Braid	21-22
Carpet (white)	14-18
Carpet (colored)	10-12½
Seedy.	
½ Blood	35-37
⅜ Blood	27-30
¼ Blood	23-26

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Unlimited Freight Facilities to all parts.
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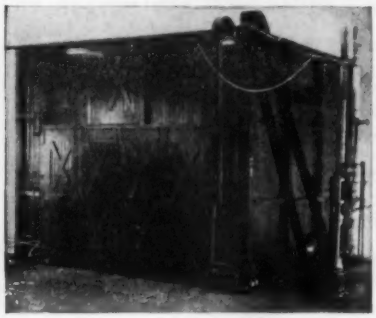

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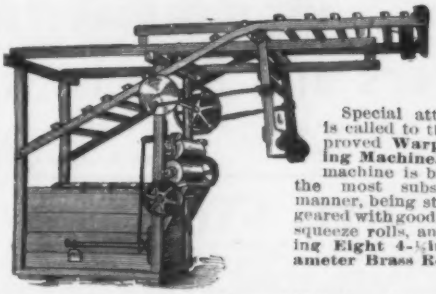

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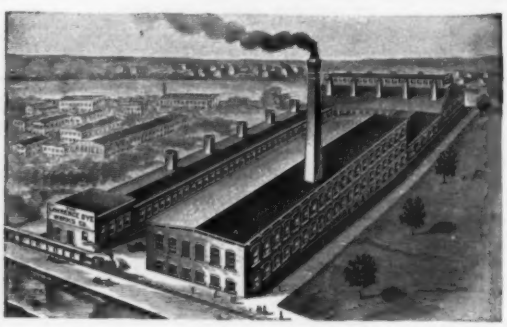

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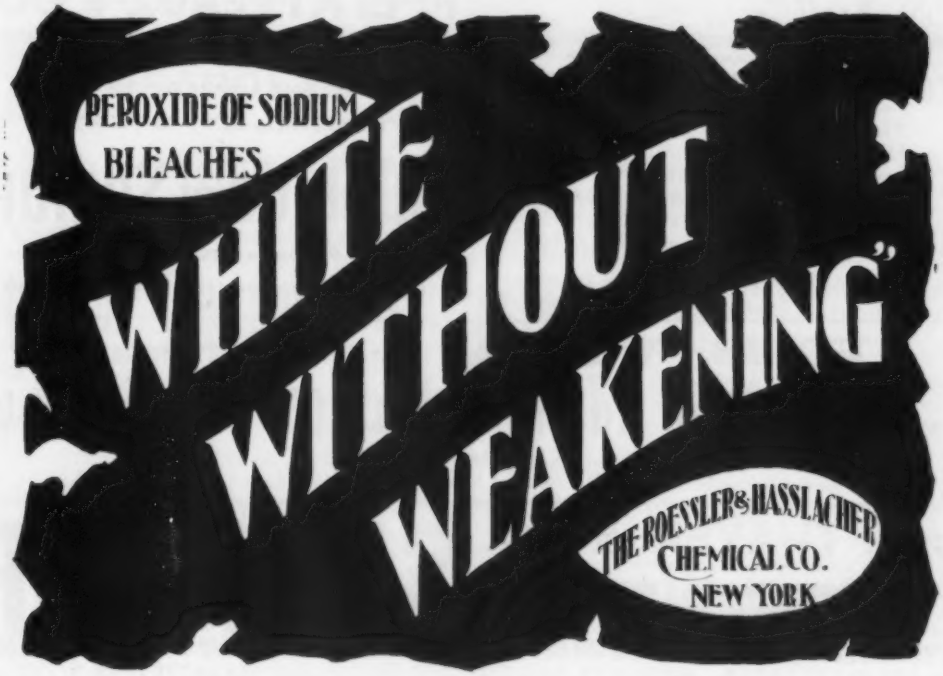
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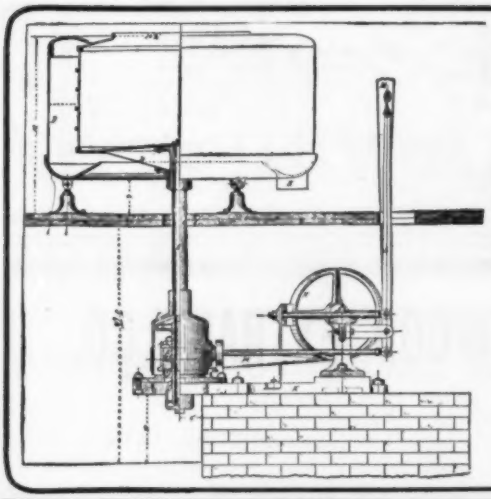

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Dyeing, Bleaching, Printing and Finishing Machinery.

PAPER ROLLS,
STEEL ROLLS,
BRASS ROLLS,
WOOD ROLLS,
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SPECIAL MACHINERY BUILT TO ORDER.

THE FRANKFORD MACHINE WORKS,

FRANKFORD, PHILA., PA.

We Build TANKS

OF ALL SIZES

Pine, Cedar, Cypress and Southern Pine
Draw Lugs for Tank Hoops

GET OUR ESTIMATES

D. B. STEVENS & CO.,
145-147 Turner St., Auburn, Me.

Modern Wet Finishing Machinery

Continuous Crabbing, Opening and Folding, Steam Finishing, Tentering, Sewing and Tacking Machines.

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Washing, Chemicking. Squeezing, Open Soapers, Sewing Machines, Scutchers and Angular Guides.

Columbian French Napping Machines

SOMERVILLE MACHINE WORKS, Successors to BIRCH BROS. ALBERT BIRCH, Prop. (No connection with any other concern.)

Send for Circulars and Prices.

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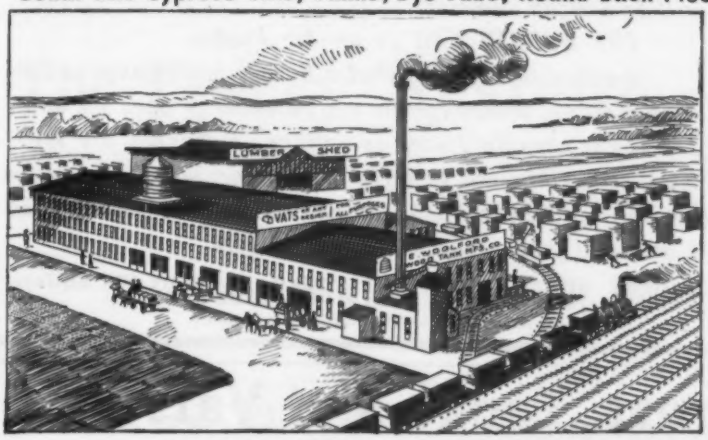
G. WOOLFORD WOOD TANK MFG. CO.

Cedar and Cypress Vats, Tanks, Dye Tubs, Round-Back Piece Goods' Dye Tubs, Bleaching Tubs, Boiling Kiers, Reservoir, and

ANYTHING IN THE SHAPE OF A TANK.



We now have our new plant, covering over two acres of ground, in complete running order, and can serve you to any extent and with promptness

OFFICE, REAL ESTATE TRUST BUILDING,

S. E. Cor. Broad and Chestnut Streets, Philadelphia.

WORKS, DARBY, PA., P., W. & B. R. R.

CALDWELL TANKS & TOWERS

"Absolutely safe and reliable. Ask your friends."

ACCURACY

is the key-note in the construction of

THE CALDWELL STEEL TOWER.

We see that every part fits carefully before we ship them. No expensive help necessary to erect it. A carpenter and one helper can do it by following the directions we furnish with each outfit, or we will send our men if you prefer. A postal will bring our illustrated catalogue and price list.

W. E. CALDWELL CO.,

Louisville, Ky.

The New Cup Defender "Reliance"

will be a Wind Jammer.

THE BARNEY FAN is an Air Pusher.

A mill man suggests that a Barney fan be used to furnish a steady breeze for the cup defender. Says he don't see why it shouldn't work as well as it does in his mill. We may go into the yachting field later, but just now we are selling Barney Fans for any air-moving jobs around a mill and guarantee them to do the work.

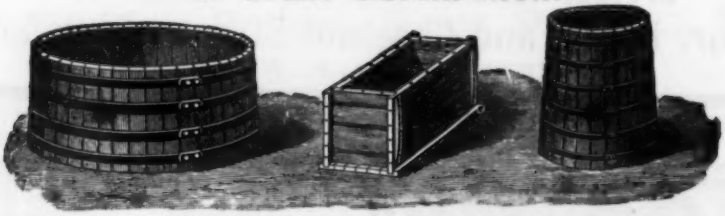
FACE VIEW.

BARNEY VENTILATING FAN WORKS, 165 Fort Hill Square, BOSTON.

ALBERT B. FRANKLIN, Proprietor.

Cypress Tanks and Vats

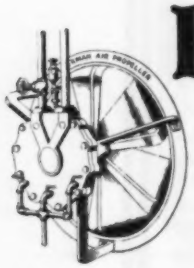
OF EVERY DESCRIPTION.



Cypress is remarkable for its great durability. There is no other wood so well adapted for the manufacture of Tanks, Vats, Cisterns, Dye Tubs, etc. We handle Cypress from the Stump, and our stock is of the best.

Our Tank Factory is complete. Let us know your wants.

THE A. T. STEARNS LUMBER CO., BOSTON.



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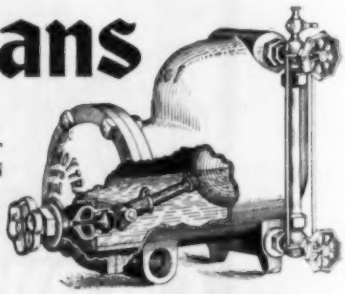
WITH DIRECT CONNECTED ENGINES.

ECONOMICAL FIRST COST OPERATION

Can be run at any speed and any time. No long shafting and belts to waste power.



THE HANDY TRAP.
Saves Time and Fuel.

For Dye Rooms, Factories, Boiler Rooms, or where there is moisture or dust they are the best apparatus ever installed.

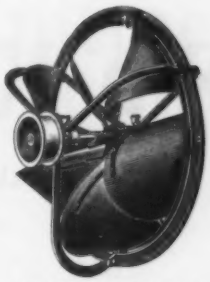
Write for Particulars.

E. M. NICHOLS, 639 ARCH STREET, PHILADELPHIA, PA.

"Have you tried

The Berry System of Drying

on your machine?"



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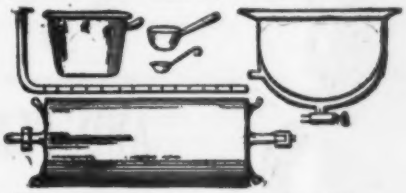
PAUL BEER,

Coppersmith, Manufacturer of Copper Kettles and COPPER LOGWOOD EXTRACTORS (Plain and Jackets)



Copper Steam Pipes, Coils, Dippers, Steam Boards and Heavy-Tinned Steam Cylinders,

831 N. Fourth Street, PHILADELPHIA.

Repairing Neatly Done.

NEW ENGLAND VENTILATING & HEATING COMPANY.

Ventilating, Heating, Humidifying, Cotton and Wool Conveying by Blower System, Tin Cylinders, Roving and Drawing Cans, Separators, Tape Pulleys.

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926, 928 930 Manton Ave.,

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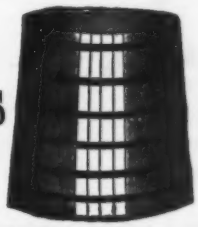
THE CYPRESS LUMBER CO.,

Cypress



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APALACHICOLA. FLORIDA.

CYPRESS TANKS

OF EVERY SIZE
FOR EVERY PURPOSE.

Cypress grows in water. Why shouldn't it be the best wood for tanks? It is. It does not warp, twist or shrink and lasts longer than other woods. We build tanks of the very best selected Cypress and build them as good tanks should be built. Send for new catalog and prices.

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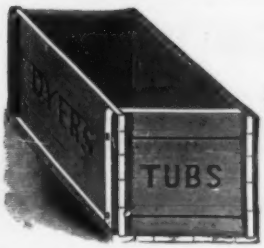
New York Office, 26 Cortlandt St.



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Manufacturers of

Cedar Vats and Tanks

2915-2933 North Second Street,

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Tubs and Tanks of all kinds for Dyers, Bleachers, Factories, etc.

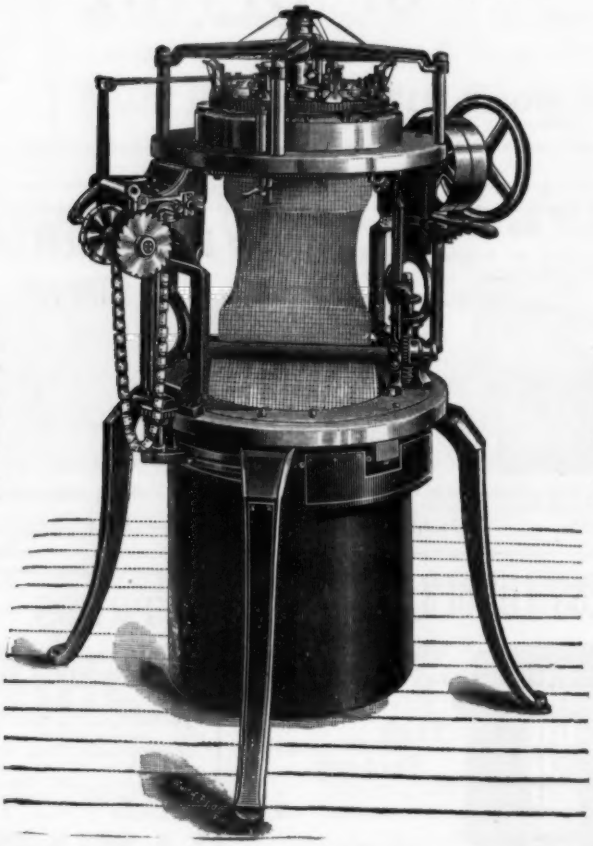
Down Town Office, 140 Chestnut Street, Corner Second.

Hours from 12 to 1.

McMICHAEL & WILDMAN MFG. CO.,

Rib Knitting Machinery,

For all classes of Ribbed Hosiery and Underwear, Combination Suits, Sweaters, etc.



AUTOMATIC AND PLAIN

ESTABLISHED REPUTATION FOR LARGEST PRODUCTION, BEST QUALITY FABRIC, DURABILTY, ECONOMY OF OPERATION.

Full Particulars, Description and Samples Furnished upon application to the

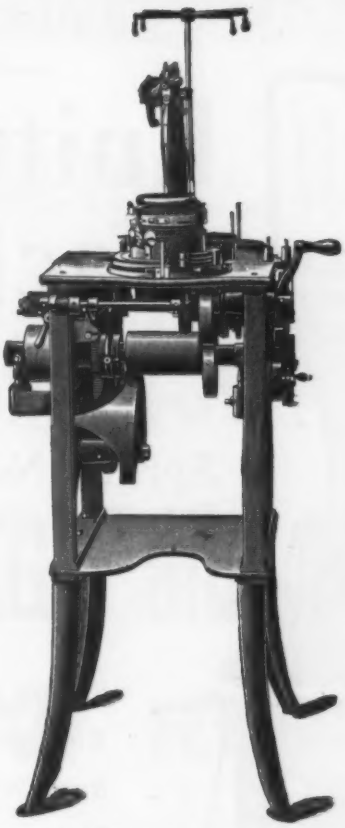
McMICHAEL & WILDMAN MFG. CO.,

NORRISTOWN, PENN.

Acme Automatic Knitter

FOR SEAMLESS HOSIERY

ALL KINDS AND GAUGES



Best method of transferring ribbed legs and tops.

Greatest production of perfect work at least cost.

All latest attachments and improvements.

Our new type of machine, just out, having absolutely positive feed on pattern mechanism, which is set by dial, and graduated disc when changing styles and sizes, is one of the greatest improvements in knitting machines for a long time.

For particulars address

MAYO KNITTING MACHINE & NEEDLE CO., FRANKLIN FALLS, N. H.

Philadelphia Office: Knickerbocker Building, Cor. 6th and Arch Sts.

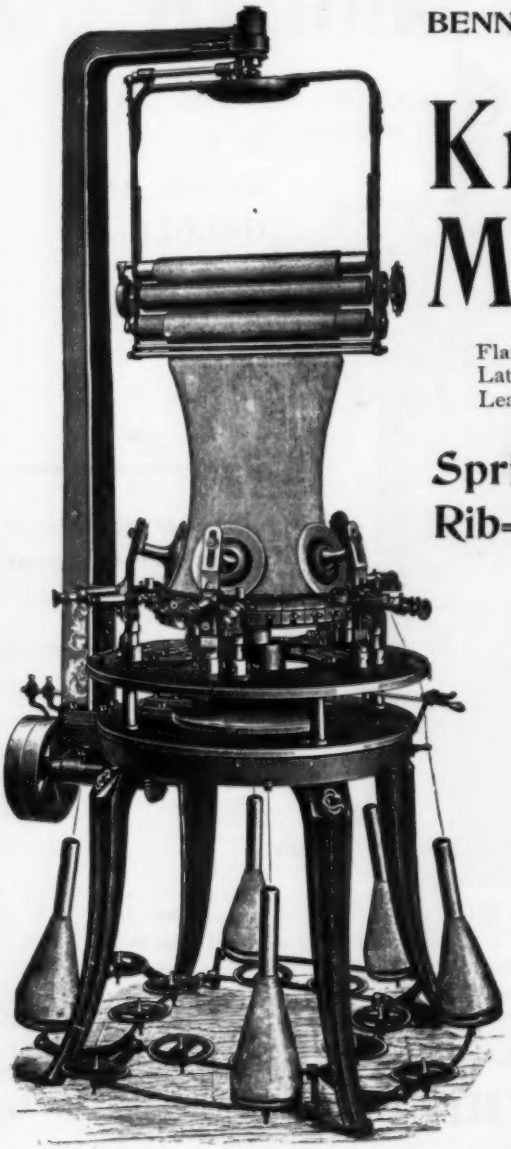
We manufacture all kinds of Latch Needles of superior quality.

Charles Cooper

BENNINGTON, - VERMONT,

MANUFACTURER OF

Knitting Machinery



Flat and Circular Rib, both Spring and Latch Needle, Plain Circular Machines, Lead or Trick Cylinder.

Spring Needle Cylinder Rib-Top Machines

For making Cuffs, Drawer Bottoms and Shirt Borders.

Spring and Latch Knitting Needles,

Burr Wheels, Burr Blades,

Sinkers, Jacks etc.

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Friedberger Mfg. Co.

Spring, 1904 Line

EDGINGS and BRAIDS

NOW READY.

All Goods Sold Direct.

MILLS AT

GERMANTOWN PHILADELPHIA

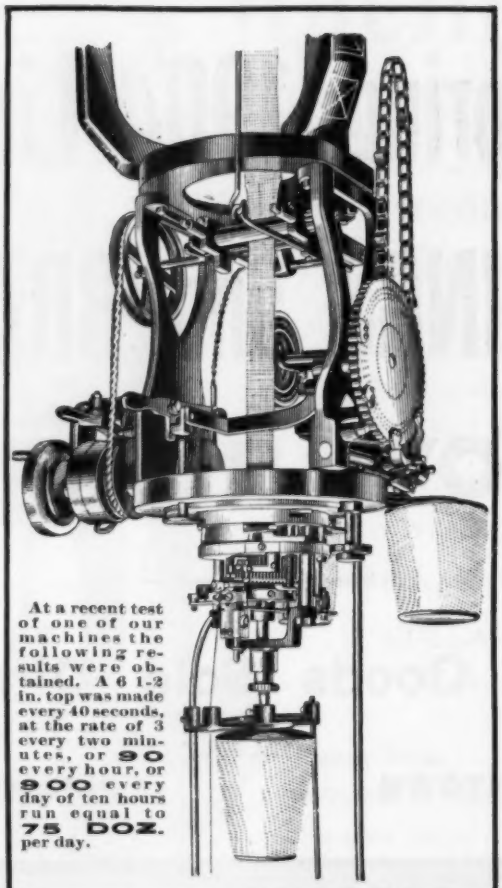
During the past month the home of the celebrated

Ruth Automatic Machines

Has been in a very

UP-SET

condition, due to the preparations for and the removal of the entire plant to the large and convenient quarters erected for us in the hustling City of York, Penn. Our business has increased so largely and rapidly that we were compelled to seek increased facilities for turning out our work. We are now fixed in our new factory and we are prepared to fill all orders promptly.



At a recent test of one of our machines the following results were obtained. A 6 1-2 in. top was made every 40 seconds, at the rate of 3 every two minutes, or **90** every hour, or **900** every day of ten hours run equal to **75 DOZ.** per day.

Have you tried our famous NEEDLES?

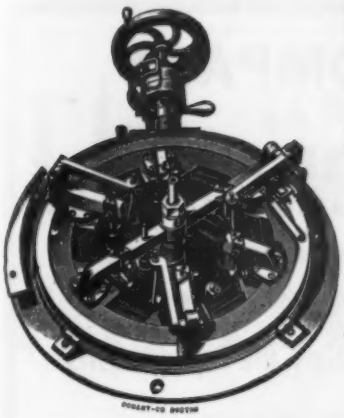
Absolute guarantee with each machine

Every machine full automatic

Our Machines EXCEL in PRODUCTION, EASE OF OPERATION, QUALITY OF FABRIC, SIMPLICITY and DURABILITY

Ruth Automatic Knitting Machine Co.

Box T-W, YORK, PA.
Formerly of Norristown, Pa.



CIRCULAR KNITTING MACHINES

Either plain or full automatic, with stop motions complete, for

Ribbed Underwear, Sweaters, Cardigans, Cuffs and Anklets.

The Leighton Circular Machines are the only ones which **Rack** or **Shog** the needles for fancy borders; also built for automatic striping; and with from 4 to 16 feeds for underwear.

Also Builders of ABEL WINDERS, SEAMERS and LOOPERS.

LEIGHTON MACHINE CO.,
Manchester, N. H.

Latch Needles

For all Knitting Machines.

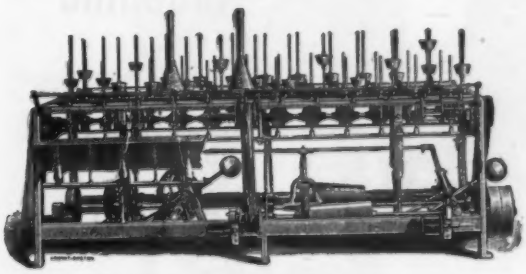
Our Superior or Sunken Rivet Head Needles

Will save you money every day in the year.

Dodge Needle Co., Manchester, N.H.

We now build, with or without differential motion, for winding on Bobbins from Skein or Cop,

THE ABEL WINDERS



ALSO THE

Abel Seamers and Loopers

IN CONNECTION WITH OUR LINE OF

AUTOMATIC RIB KNITTING MACHINERY.

LEIGHTON MACHINE CO., Manchester, N. H.

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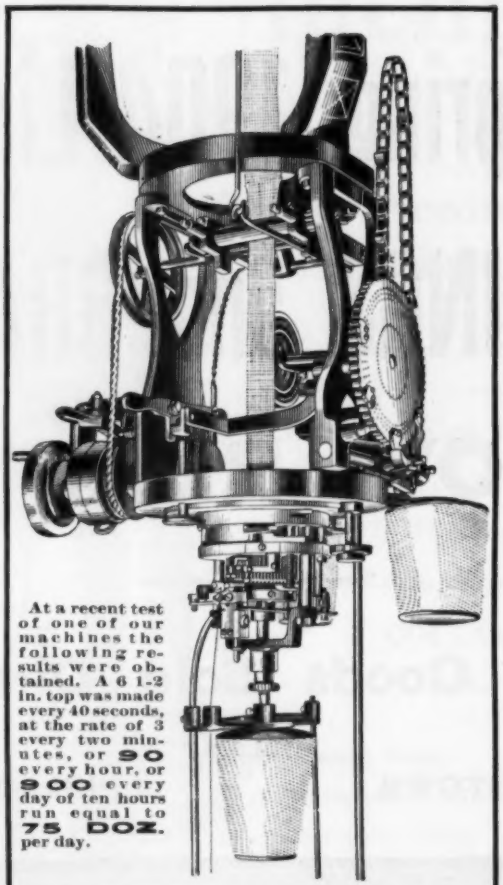

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Absolute guarantee with each machine

Every machine full automatic

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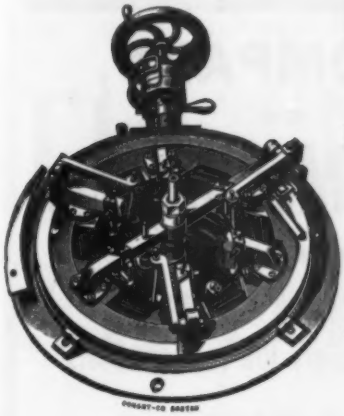
Ruth Automatic Knitting Machine Co.

Box T-W, YORK, PA.
Formerly of Norristown, Pa.



CIRCULAR KNITTING MACHINES

Either plain or full automatic, with stop motions complete, for

Ribbed Underwear, Sweaters, Cardigans, Cuffs and Anklets.

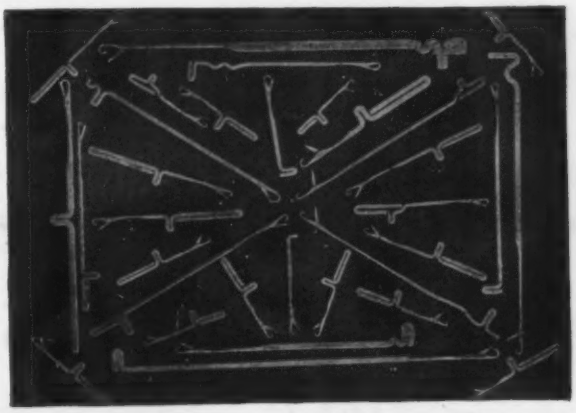
The Leighton Circular Machines are the only ones which **Rack** or **Shog** the needles for fancy borders; also built for automatic striping; and with from 4 to 16 feeds for underwear.

Also Builders of ABEL WINDERS, SEAMERS and LOOPERS.

LEIGHTON MACHINE CO.,
Manchester, N. H.

Latch Needles

For all Knitting Machines.



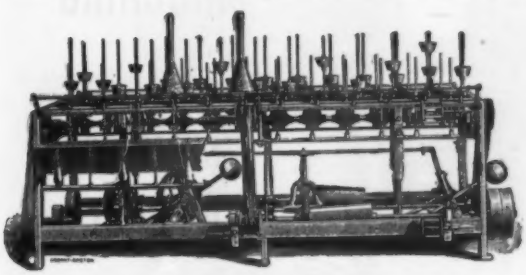
Our Superior or Sunken Rivet Head Needles

Will save you money every day in the year.

Dodge Needle Co., Manchester, N.H.

We now build, with or without differential motion, for winding on Bobbins from Skein or Cop,

THE ABEL WINDERS



ALSO THE

Abel Seamers and Loopers

IN CONNECTION WITH OUR LINE OF

AUTOMATIC RIB KNITTING MACHINERY.

LEIGHTON MACHINE CO., Manchester, N. H.

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MANUFACTURERS OF

Circular Rib Knitting Machinery,

UNDERWEAR MACHINERY,

For Ladies' Vests, Combination Suits, Corset Covers, etc., Men's Underwear, Sweaters, etc.

New Improved Sleeve Machines, Machines for Rib Hosiery, Rib Tops and Cuffs.

LATEST IMPROVEMENTS ON ALL MACHINES.

MECHANICAL STOP MOTIONS

For Circular Rib Knitting Machines.

OFFICE AND SHOW ROOMS:

606 ARCH STREET, PHILADELPHIA.

The "INVINCIBLE"

A machine of the highest grade.

Practical and Economical in operation.

A Big Producer.

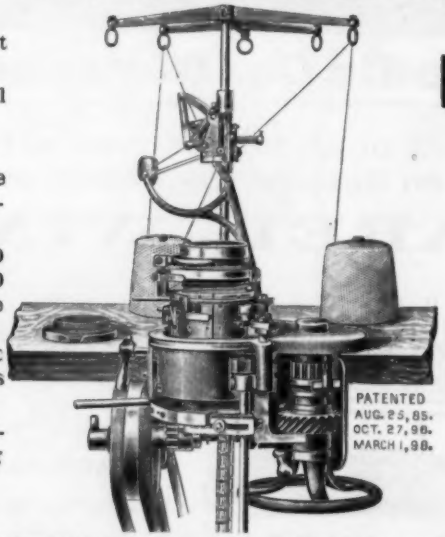
Gauge of machine changed by simple changing cylinders.

The Invincible METHOD OF TRANSFERRING RIBBED TOPS is quicker and more positive than others.

No experience required to transfer ribbed tops by this method.

YARN CHANGED automatically without revolving bobbins.

Write for Catalogue.



Full Automatic Knitting Machine

For all kinds and gauges of

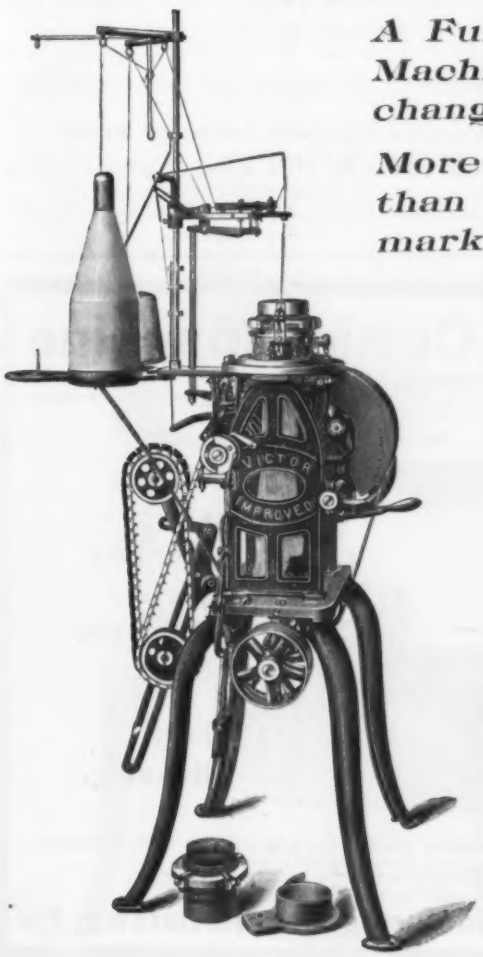
SEAMLESS HOSIERY

PAWTUCKET, R.I. U. S. A.

E. JENCKES MFG. CO.

BRANCH OFFICE, Room 370, Bourse Bld'g, PHILADA, PA.

The "New" Victor Knitting Machine



A Full Automatic Seamless Machine, thoroughly interchangeably in all its parts.

More simply constructed than any machine on the market.

FULL AUTOMATIC TWO-COLOR STRIPING MACHINE

and Automatic Lace and Stripe Machine

American Knitting Machine Co.

Southern Branch,
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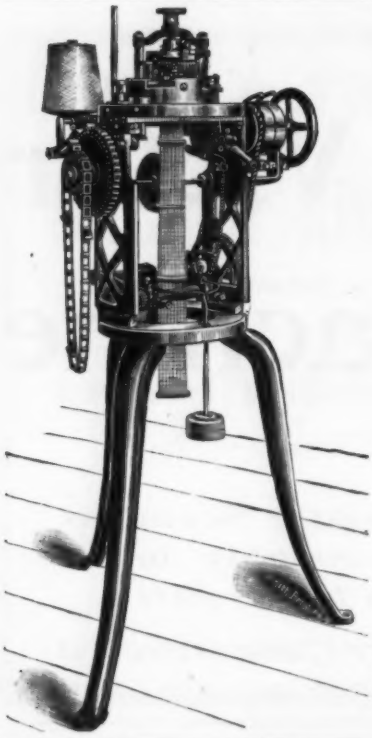
R. M. OATES, Repr've.
Factory at Woonsocket, R.I.

Main Office, Knickerbocker Bldg.
Cor. Sixth and Arch Streets, PHILADELPHIA, PA.



H. Brinton & Co.

213-215 Race Street, Philadelphia, Pa.

BUILDERS OF

Knitting Machinery

For HOSIERY and UNDERWEAR.

Complete Estimates Furnished. Send for Particulars.

The cut shows our **Improved Automatic Ribber** with Welt and Slack Course for Half Hose, Tops and Ribbed Legs.

Adams Rib and Top Cutting Machine

FULLY AUTOMATIC.

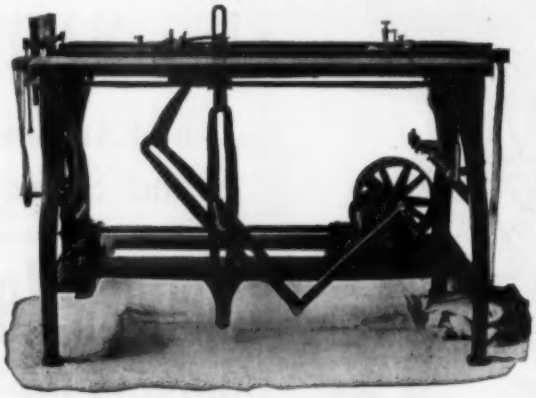
Cuts all Fabrics with or without Welts. Requires no trimming after passing through machne. Perfectly clean work.

Solidity.

Simplicity.

Absolute Positive Movements.

Best Materials.



Cutting and Working Parts Hardened Steel.

Easy Running.

False Welts cut out automatically. 1,500 dozen pairs, cut per day by one operator.
Saving of Labor and Goods. Can be operated by boy or girl. Accidents impossible. No Special Attachments. Patented in the U. S. A. and Europe.

Sole Manufacturers and Agents for the U. S. A.,

McMichael & Wildman Manufacturing Co., Norristown, Pa

JAMES TAYLOR,

835 Arch Street, - - - Philadelphia, Penn.

KNITTING MACHINERY

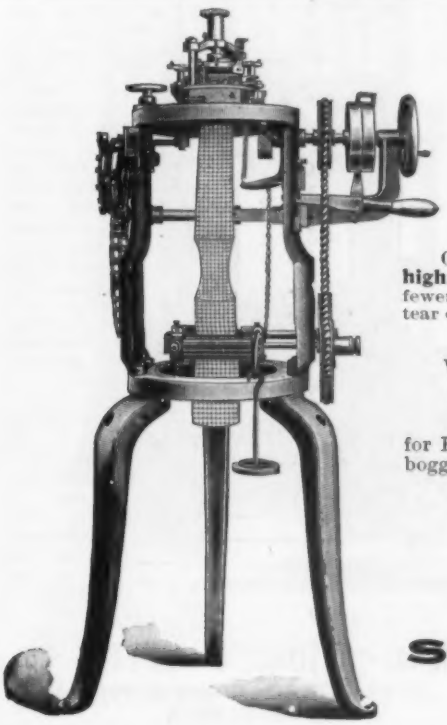
OF ALL KINDS. NEW AND SECOND HAND.

A RARE OPPORTUNITY TO BUY.

2 Crane tables, 2 heads each, 18 and 20 inch.
66 Brinton, ¾ auto. Knitters, sizes 2¼ to 3½, 2 cylinders each.
1 Steam hosiery press.
2 Cornely hosiery embroidery machines.
1 McCreary double roll, 36 inch fleecer, like new.
20 Ribbed underwear machines, 8 to 20 inch.
20 Loopers, 8 to 18 point.
580 Tompkins bobbins.
1 Scott & Williams, late style, cross bar machine, like new, (makes edging, sews it on and inserts the tape all in one operation.
1 Sturtevant No. O cupulo blower.
1 W. & W. Cat stitch machine.
3 Merrow crochet machines.
100 Welters and trimmers, single and double thread.
5 Mayo Acme machines, 3¾ inch.

WRITE FOR COMPLETE LIST.

We are always in the market to buy good second-hand Knitting and Finishing Machinery.



High Speed Rib Knitting Machinery.

Our latest model machinery has been designed to run at **very high speed**, giving large production. This is accomplished with fewer seconds, less breakage of needles, less jar and wear and tear on machines than has been customary at lower speeds.

We also make Special

STRIPING AND DESIGNING MACHINES

for Fancy Golf Stockings, Bathing Suits, Sweaters, Toques, Toboggan Caps, Skirts, etc.

Our Machinery gives large production at low cost and enables manufacturers to meet the market always and make a profit.

STAFFORD & HOLT,

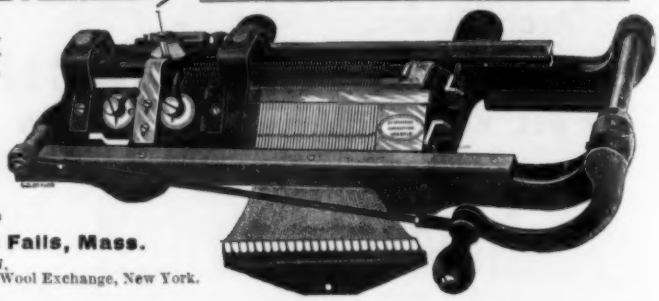
LITTLE FALLS, N. Y.

The LAMB, LEADER OF KNITTERS,

Original and Still the Best.

Most widely used; being operated in every civilized country in the world. For description, prices, etc., see catalogue.

CIRCULAR MACHINES,
RIB TOP and
SEAMING MACHINES.



LAMB KNITTING MACHINE COMPANY,

P. O. Box 5888, Chicopee Falls, Mass.

J. E. WOODHEAD, 100 22d St., Chicago.
L. D. SANBORN, Room 505 Wool Exchange, New York.

Striping Attachments

for Latch and Spring Needle Knitting Machines

These Stripers are being rapidly adopted by representative mills, among whom may be mentioned:

Whitman Bros. and Gilbert Knitting Co., Little Falls, N. Y.; Commercial Mills, Troy; R. Forbes Co., Hespeler, Ont.; Hygienic Underwear Co., Phila.; Gantner & Mattern, San Francisco; Gonzales Mill, Mexico.

Send for Particulars

BABCOCK MACHINE WORKS

FORT PLAIN, N. Y.

Pepper Machine Works

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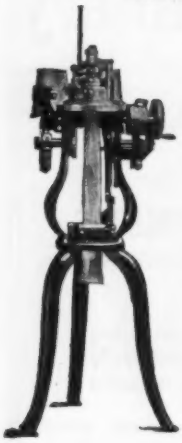
Successors to
Pepper Manufacturing Co.

Manufacturers of



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INCLUDING

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Automatic Welt and Loose Course Machines for Stock Tops. New Circular Stripers with Welt, Loose Course and Striping (Automatic), for Short Cuffs, Sock Tops, Hose Legs, Wristers, etc.

Golf and Bicycle Stocking Machines,

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For Men's Underwear, Ladies' and Misses' Hose Legs and Leggins. Correspondence Solicited.

National Spring-Beard Needle MACHINE

For Seamless Hosiery.

The only Machine on which the speed is advertised.

This Tells the Whole Story.

Best results guaranteed at 300 to 400 revolutions per minute, according to guage, hence the largest production by 25 to 40 per cent. over all other machines. Least cost for repairs, smallest needle breakage and lowest per cent. of menders. Full automatic, practical double-sole and high-heel splicer. Device for producing a great variety of lace effects, with no breakage of stitches and no infringement.

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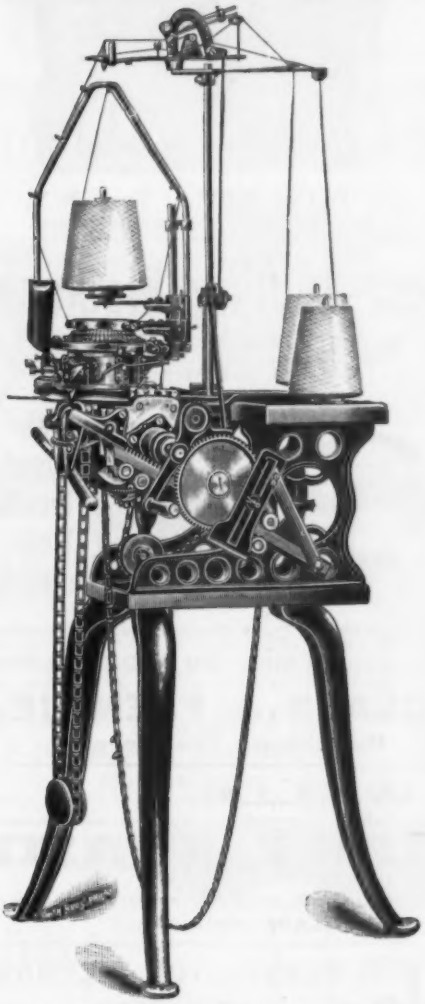

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Regular 7-8 Automatic for all classes of Cotton Hose. Special 3-4 Automatic for Wool.

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Superior to All Others in Economy of Operation, Production and Fabric.

Best Built, Easiest Operated, Superior Fabric.

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Estimates Furnished for Complete Hosiery Plant.

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Manufactures the only

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that give manufacturers full value for their money. Knits Ladies' and Children's Plain Fashioned Hose, Half-hose and footing. Fancy Ribbed Goods, high speed. Need no skilled operators. The 15-16 runs with one single belt; automatic tension device in the leg, heel and toe, thereby making large, perfect heel and toe. Built in sizes from 2 1-4 up to 4 1-2 inches in diameter.

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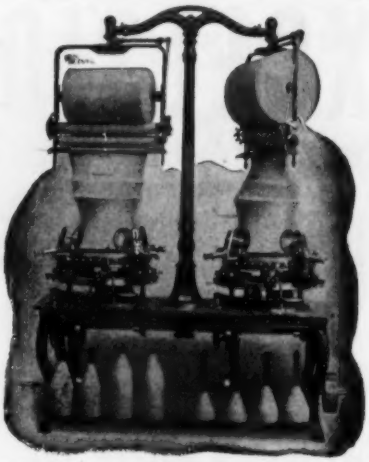
This Cut Shows Our Latest Improved 15-16 Automatic Machine: for Simplicity and Durability it has no equal.



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Knitters, Winders, Burrs, Attachments.

THE BEST

Full-Fashioned Hosiery Machines

Simplicity, durability, large production, fine work are the characteristics of the machines for knitting fashioned hosiery made by the

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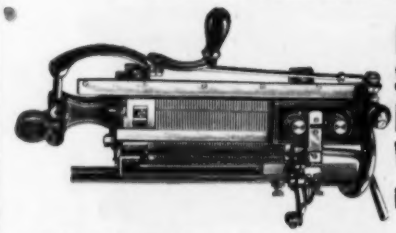
IMPROVED CONSTRUCTION

For Hand and Power Driving.



High Speed, Excellent Work-manship.

Auto. Rib-top, Fancy-stitch Jacquard Machines.

Everywhere in work. **80,000** Machines sold.

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The Only Perfect Stamp for Hosiery, Underwear and all Woven Fabrics. BLOCKS FOR PRINTING HOSIERY.

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FOR ALL KINDS AND GUAGES OF SEAMLESS HOSIERY.

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Exclusive rights to BROWN'S ATTACHMENTS FOR LACE EFFECT.

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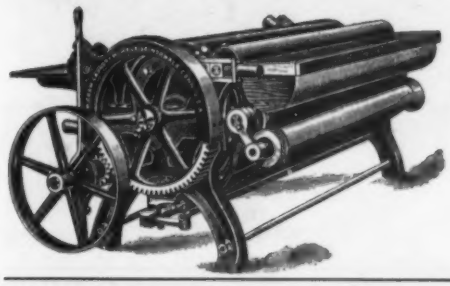

This machine irons and presses ribbed and flat underwear, giving a fine, smooth finish and most attractive appearance to the goods, not to be obtained in any other way. It does not break buttons. Inexpensive and easy to operate, and has large capacity. Knitting mills using them are greatly pleased with results. This method of finishing is sure to come into universal use. Send for further particulars to

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Needle working from the inside, avoiding the breaking of needles and points and picking up the metal.

Single and Double Stitch, or Both Combined.

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For Fancy and Full Fashioned Goods.

Our Specialties are for Machines for Knitting **SWEATERS, GOLF JACKETS, FANCY VESTS, Etc., in Plain, Honeycombed and Other Fancy Stitches.**

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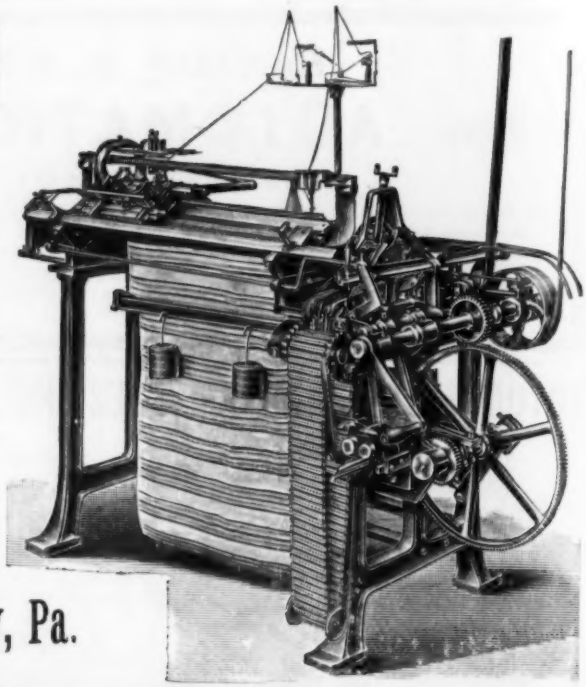

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COTTON'S SYSTEM.
built machine. Better Fabric. Highest production. From 12 to 24 sections and 2 to 4-color striping attachments for making full-fashioned Hosiery and Underwear.

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9 to 24 sections for making rib tops and rib hose with or without narrowing attachments. Also dealer in Anton Haase's Imported Needles and Hosiery Machinery Supplies.

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Unshrinkable Underwear

Messrs. WILDT & CO., Liecester, England, can offer for the United States of America

THE BOLTON PROCESS

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IT HAS NEVER FAILED

Rights for Great Britain, Germany, Austria, Denmark, Switzerland, Sweden, Canada and Italy have already been purchased.

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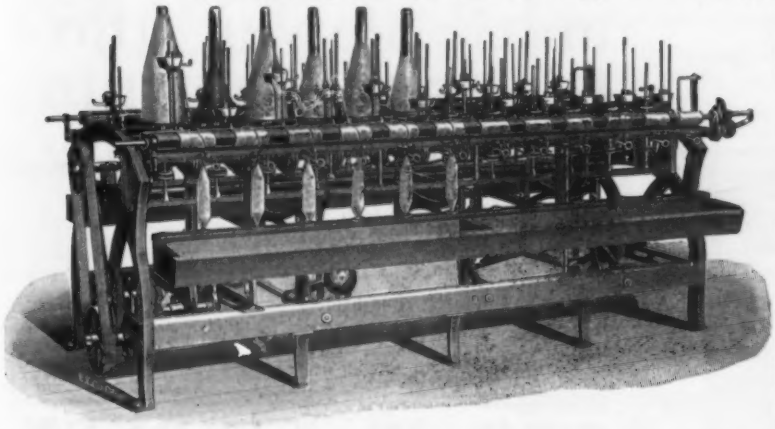
For Hosiery Mfrs., Wind for Cop, Skein or Bobbin.



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To Spool from Cop, Skein or Bobbin.

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Repairs to Hosiery and Underwear Machines, Cylinders and Dials of every description.

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We HARDEN all CYLINDERS and DIALS large and small.

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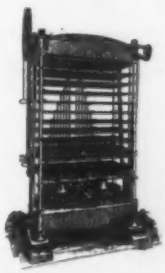

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The most reliable machine of the kind on the market.

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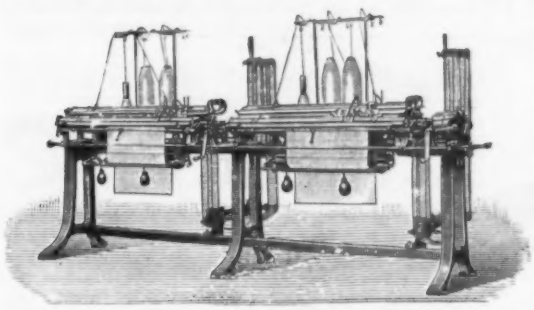

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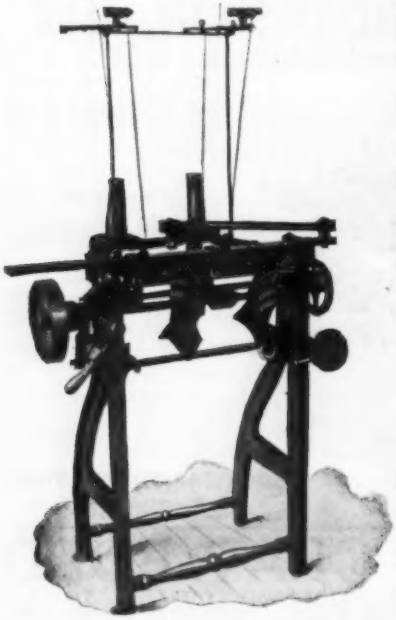
Flat Knitting Machines

(LATCH NEEDLES.)

This **FULL AUTOMATIC POWER KNITTING MACHINE** has independent heads; the machines placed on one stand may be of different gauge and even different width of needle-space. The machine can be used most variously for the manufacture of all kinds of ribbed fabric (1 & 1, 2 & 1, 2 & 2, Cardigan and Half-Cardigan), rib-tops, Sweaters, Ladies' and Children's Garments, Vests, Jackets, etc. Special construction for Shaker bodies and plain, seamless Shirts with arm-holes.

AUTOMATIC NARROWING MACHINES—Own Invention. **Patentee and Sole Makers of the "TEUTONIA,"**

Best and quickest hand-knitting machine for hose and half-hose. Griswold heel, Narrowed toe.



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SOMETHING ENTIRELY NEW

Will produce two fingers at once.
No weights required to hold work down.
Machine works entirely automatic.
No waste of material.
No skilled help required to run the machine.
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FOR WELTING, OVEREDGING AND SELVAGE EDGES, FOR SWEATERS AND HOSIERY, KNIT GLOVES, ETC. TO SEW IN SLEEVES. NO TRIMMER.

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The "Industrial" Overseaming Machine

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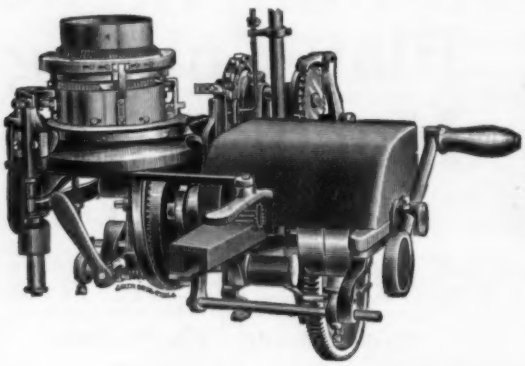
Largest Permanently Operating Knitting Exhibit in the U.S.A.



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"INCORPORATED."

Our New Knitter is nearly Full Automatic. You knew our old Keystone, it was a good one. This one is just as good. It is a simple durable knitter, having but few parts, and remarkable for its absence of springs, and small features. Capable of a large production and guaranteed to produce good work. Machine without change can be used for transfer work, or ladies' shaped hose.

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All Work Guaranteed. MANCHESTER GREEN, CONN.

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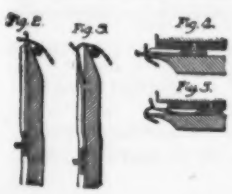
Needles and Supplies for Knitting Mills.

Agents for EXCELSIOR NEEDLE CO., and NATIONAL NEEDLE CO.



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Saves Mending and also Breaking of Needles.

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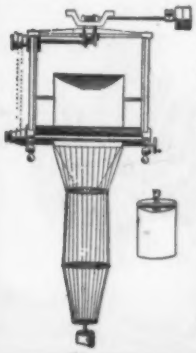

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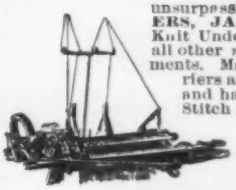

unsurpassed for full fashioned **SWEATERS, JACKETS, LEGGINS,** regular Knit Underwear, **UNION SUITS,** and all other *regular* and *selvage* Knit Garments. Made with 2 complete yarn carriers and 2-color striping attachment and has the new combined Sweater Stitch Drop Lock and Tubular Lock. Special Glove Machines, Finger-Knitting Machines 3 inches width of needle-bed. **Rapid 2-Thread Lock-stitch Overseamers.**

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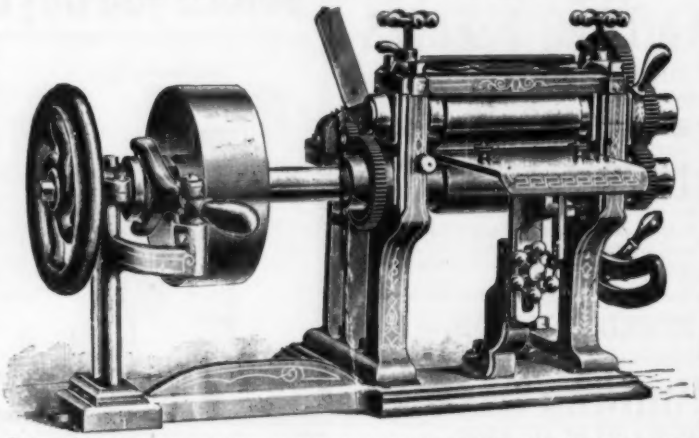

Also Full Line of

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Send for Circulars.

THOMAS KENNEDY & SON,

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The Latest Automatic Band Stay, and Facing, Folding and Cutting Machines. Patented.

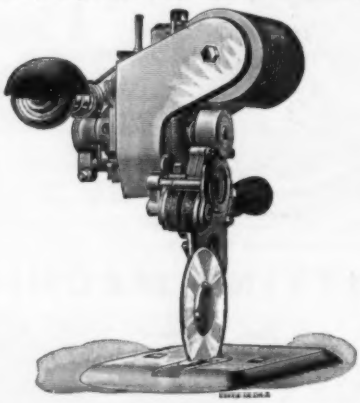
For folding into exact shapes and cutting off accurately into any desired length all styles, and sizes of Button-stays, Facings, Suspender Straps, Straight Drawer Bands, etc., used in finishing Knit Underwear.

The "STAR" CUTTER

Shown below is especially adapted

For Knitting Mills.

Cuts Any Shape and Many Thicknesses of Fabrics.



Has ball bearings; requires but 1-6 horse power; uses direct current; patent flexible take-up device. Acceptable to insurance underwriters. Repairs almost nothing. Now in use by a number of first-class knitting mills, to whom reference can be made.

WOLF ELECTRICAL PROMOTING CO.,

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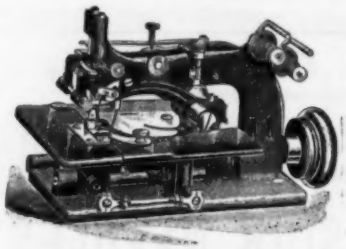
Champion Rib Knitting Machines

For HOSIERY AND UNDERWEAR



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Estimates Cheerfully Given.

Our New Overseaming Machine.

CHAMPION MACHINE CO.,

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CELEBRATED BRAND PYRAMID TRADE MARK **LACINGS**

For Underwear, Overshirts and Sweaters,

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LACINGS FOR OVERSHIRTS and UNDERWEAR.

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TRADE MARK.

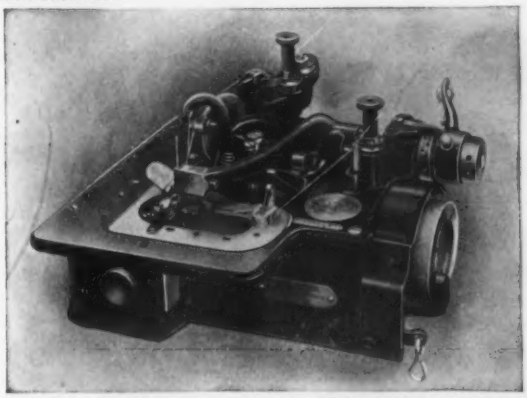
Business Est. in 1859

WILLCOX & GIBBS

"OVERLOCK" Machine.

(TRADE MARK.) (Pat. April 5, 1892.)

Patent twice upheld by the U. S. Court of Appeals.



FOR TRIMMING, SEAMING AND OVER EDGING (OR HEMMING) KNIT UNDERWEAR

WARNING !

Manufacturers and dealers are warned that not only is the "Overlock" Machine fully protected by Patents of April 5, 1892, and one of May 26, 1896, but the edging products are also protected by Patents of March 10, 1896, and Dec. 26, 1899.

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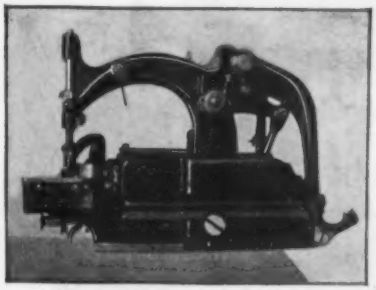
General Offices:

Nos. 85-87-89 Bleecker Street, near Broadway, NEW YORK, N. Y.

Also, LONDON.—PARIS.—DRESDEN.—MILAN.

The Arnold Sewing Machine Co.

216 High Street, NEWARK, New Jersey.



Overedge Welting Machine, *with Trimmer.*

The very best in the market. (No royalty.)

Overedge Seaming Machine, *with Trimmer.*

3000 stitches per minute. (No royalty.)

Overedge Sewing Machine, *without Trimmer.*

For manufacturers of knit goods and other fabrics, with or without trimmers.

Our claims are Simplicity, Durability, Accessibility,

EVERY PART OF OUR MACHINE BEING READILY ACCESSIBLE.

This machine has 100 less parts than any other overedge machine.

THE CHEAPEST and BEST METHOD
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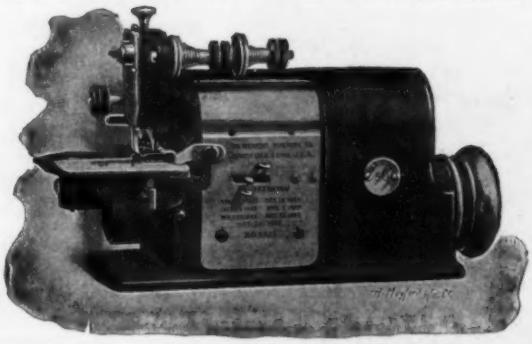
FINISHING RIBBED KNIT GOODS
IS BY THE USE OF
OUR HIGH SPEED MACHINES.



BLANKETS, SKIRTS or COTTON GOODS,
requiring a useful and Ornamental Finish, should be finished by some of our various machines adapted for special purposes and finishes.
Send for Catalogue and Samples, stating the kind of goods to be finished.

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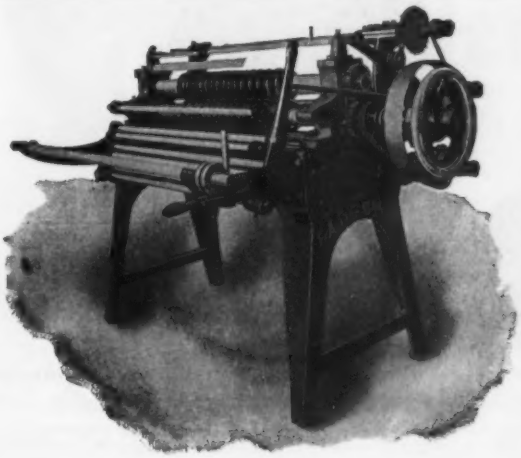
OUR NEW DRAWER STRAPPING MACHINE
SHOWN BELOW will sew on Straps of any width and thickness, makes either Wide or Narrow Stitching across the Straps and will also BAR each end of the stitching.

UNION BUTTON SEWING MACHINE CO., 164 High St., Boston.

MAKE YOUR OWN PAPER BOXES!



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Paper Box Machinery.

Supplies Complete Outfits for Knit Goods Manufacturers.

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The American Knitting Industry in 1903

¶ THE AMERICAN DIRECTORY OF THE KNITTING TRADE IN THE UNITED STATES, CANADA AND MEXICO FOR 1903 has just been published and will be sent to any address on receipt of the Price, $2.00. *Contains a List of the New Mills—corrected up to date.* Has flexible covers so that it may be carried comfortably in the pocket. *Is of incalculable value to manufacturers of Machinery or Supplies catering to the Knitting Trade.* . . . . .

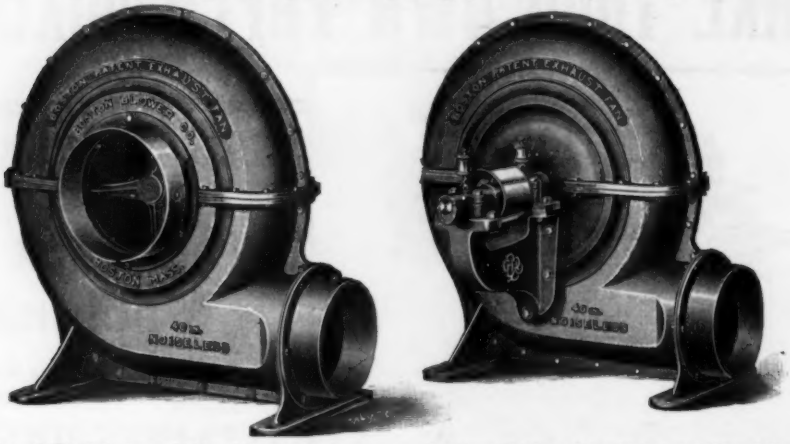
Published by

LORD & NAGLE COMPANY

PHILADELPHIA, PA. .. .. BOSTON, MASS.

Boston Wool Exhausters, with Removable Tops.

As used in Connection with Pneumatic Conveyor System for Handling Wool, Cotton, Rags, Excelsior, Jute, etc.



Inlet Side of Right-hand Wool Exhauster. **Pulley Side of Left-hand Wool Exhauster.**

This machine is similar in design to the regular Boston Patent Exhaust Fan, but is fitted with a special wheel for handling fibrous materials, and the top is removable.

This latter feature is especially desirable when handling wet or greasy materials or in handling anything, in fact, which would leave a deposit on the inside of fan, as the entire top may readily be removed for inspection or cleaning without disconnecting either pipe or belt connections.

BOSTON BLOWER CO., Main Office and Works: **Business and Glenwood Sts., HYDE PARK, MASS.**

WATER WHEELS

FOR ALL HEADS FROM 3 FEET TO 2000 FEET.

Adapted to all **POWER** Purposes. Easy working balanced gates. We guarantee greatest power with smallest quantity of water, at both full and part gates.

State Head and Power Required.

AUTOMATIC ENGINES

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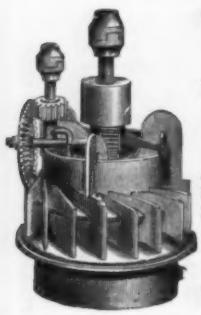
JAMES LEFFEL & CO., Springfield, Ohio, U. S. A.



TURBINES

ON HORIZONTAL AND VERTICAL SHAFTS.

These wheels are specially designed and adapted to TEXTILE MILLS

The records of the Risdon Wheel are not equaled by the records of any other wheel. Average of results of tests in Holyoke Flume: Full Gate, .8694; Seven-eight, .8472; Three-quarter, .8014; Five-eighth, .7601.

RISDON CELEBRTAED TURBINES. ALCOTT HIGH DUTY TURBINE. Unequalled Efficiency. Easy Working Gate. Greatest Power from a Limited Quantity of Water at Smallest Cost.

TAYLOR SLEEVE GATE TURBINE. The largest power ever obtained from a Wheel of the same diameter.

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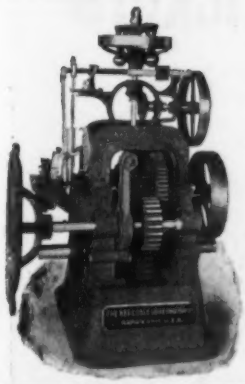
"ABC" Ventilating Fan

The Strongest and Most Powerful Disc Fan on the Market.
Furnished for Pulley, Engine or Motor Propulsion.

Catalogue 140 G on request.

American Blower Company,
DETROIT, MICH.

NEW YORK CHICAGO LONDON



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FOR
TEXTILE MILLS
Electric Light, Power and Railroad Work

We are now prepared to **guarantee absolute satisfaction.** Write for references in your locality.

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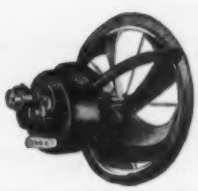

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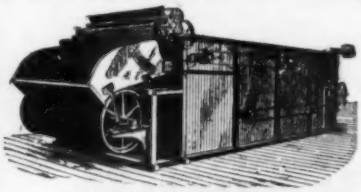
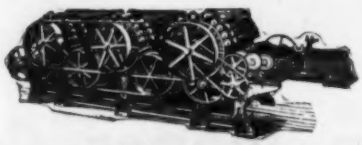


Automatic Cotton Stock Dryer.

Automatic Yarn Dryer.

"CYCLONE" DRYERS

For Cotton Stock, Wool Stock, Rags,
Yarn, Cloth, Underwear, Stockings, Etc.



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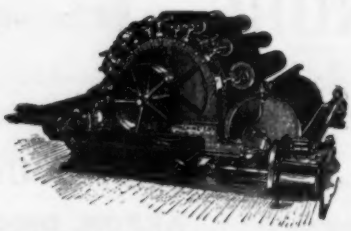
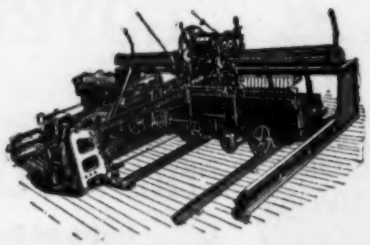
Garnett Machines and Pickers

For reducing to fibre Cotton and Woolen
Waste, Cloth Clippings, Etc.





"FURBUSH" Woolen Mill Machinery

Including Pickers, Cards, Mules, Twisters,
Warpers, Dressers, Spoolers, Etc.

Manufactured by

THE PHILADELPHIA TEXTILE MACHINERY CO.,
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The Textile-Finishing Machinery Co.

17 EXCHANGE PLACE, PROVIDENCE, R. I.

Singeing Machines,

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Horizontal or Vertical Drying Machines, with Copper or Tinned Iron Cylinders,

Automatic Tentering Machines,

Water and Starch Mangles,

Dampening Machines,

Dyeing Machines for Chain Warps.

BUILDERS OF ALL KINDS OF

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FOR

BLEACHING

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DRYING

AND

FINISHING

Calenders for Rolling, Glazing, Chasing and Embossing, also Calenders for Moire Finish.

Patent Combination Rolls made of Cotton and Husk especially adapted for Soft Finish, Unequalled for Elasticity and Durability.

Cotton, Paper, Husk, Chilled Iron, Brass and Rubber Rolls, Electro-deposited Copper Rolls for all Purposes.

Padding and Drying Machines for Shade Cloths.

Single and Double Cylinder Engines.

Hydraulic Presses and Pumps.

Estimates, drawings and full particulars of complete plants furnished on application

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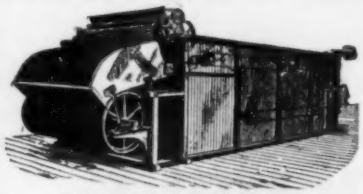

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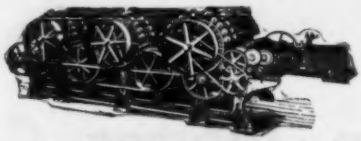

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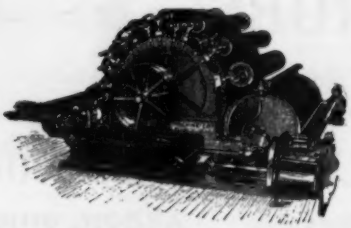

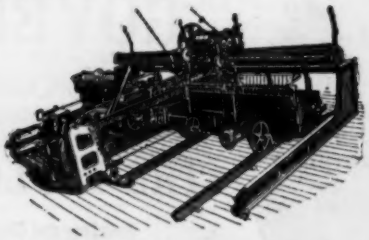

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FOR

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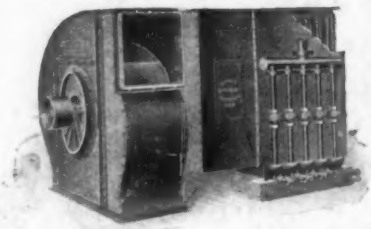
FOR MORE COMPLETE LINE SEE PAGE 59.

Buffalo Fan System



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Air Circulation Positive and Uniform, and Under Absolute Control. See New Catalogue.

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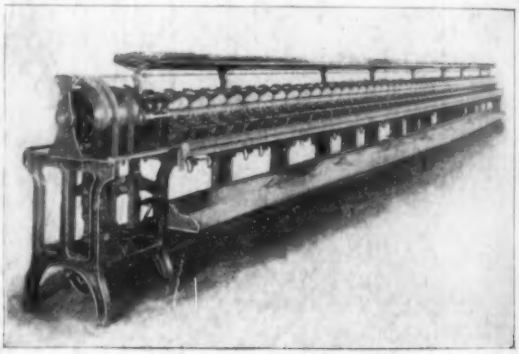
for Cotton, Silk and Worsted.



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